January 1993

BEST PRACTICE PROGRAMME

General Information Report 12

energy management guide

Energy Policy	Organising	Motivation	Information systems	Marketing	Investment

ORGANISATIONAL

ASPECTS OF

ENERGY

MANAGEMENT

Energy Efficiency Office
DEPARTMENT OF THE ENVIRONMENT

As part of its on-going programme, the Energy Efficiency Office is committed to providing guidance to all organisations that wish to review their current status in terms of the 'organisational aspects of energy management'. The EEO has already published documents under its *Making a Corporate Commitment Campaign* addressed to chairmen and chief executives.

Publication of this document initiates a consultation period during which the EEO wishes to collect feedback on the application of this 'Energy Management Guide'. This feedback will be used to review all of the publications in this series on the 'Organisational Aspects of Energy Management'.

BRECSU would very much like you to be part of this process. Please send all feedback to BRECSU at the address below. The same address can also be used for requests to be kept up to date with new publications as they appear. Please use the enclosed reply slip if available.

Address for replies:

Head of Commercial Buildings Section
BRECSU
Building Research Establishment
Garston
Watford, WD2 7JR
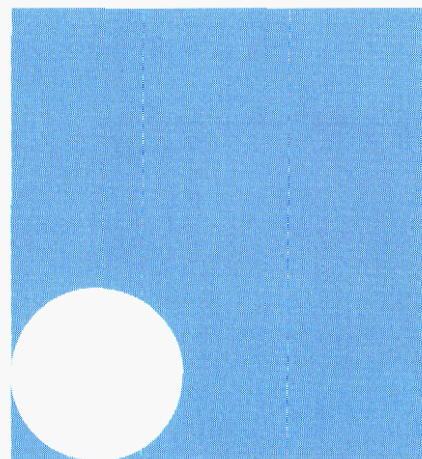
January 1993

General Information Report 12

ENERGY MANAGEMENT GUIDE

CONTENTS

SUMMARY

This guide is intended primarily for building energy managers and their line managers. It will also be useful to anyone intending to establish or review energy management activities in their organisation.

The matrix described in Chapter 2 is the key to using this guide to help you analyse energy management in your own organisation and to indicate which issues need your attention first.

The purpose of the guide is to help you assess the current state of energy management in your organisation and to give you advice about how to review your own effectiveness. The guide will help you define where you are at present and where you want to get to next. It will help you make a formal assessment of the following 'key' organisational aspects of energy management.

- *Energy policy:* why you need a formal commitment to energy management from your organisation.
- *Organising:* how to integrate energy management into your organisation's formal and informal management structure.
- *Motivation:* how to build effective relations with energy users and motivate them to conserve energy.
- *Information systems:* what is an appropriate and effective information system.
- *Marketing:* where and how to promote and publicise energy management and your achievements.
- *Investment:* how to identify projects and justify investment in increased energy efficiency and how to demonstrate value for money to top management.
- *Funding:* what are the options for funding energy management activities.

Background

The advice in this guide is derived from two recent surveys of energy information systems. Over 100 organisations responded to these surveys. All had an annual energy spend in excess of £500,000 and about half were private companies and half in the public sector. The key findings of the surveys were:

- information about energy is poorly integrated into management systems
- in half the organisations contacted energy management is marginalised as a technical speciality
- only a third of the respondents believed they had energy use under control in more than three-quarters of their buildings
- energy information systems are working smoothly in less than 10% of the organisations contacted
- organisations with many small premises have special problems getting reliable meter readings of consumption.

Aims

Typically, appeals to control energy consumption do not directly motivate most managers or end users. Most *senior managers* in an organisation are not immediately concerned with conserving energy. Their main priorities are for the organisation's survival, its efficiency or profitability, and for their own professional development.

The concerns of *energy management staff* include: monitoring consumption, setting targets, identifying and correcting faults, motivating staff to conserve energy and identifying and implementing energy saving measures.

These two sets of aims – of *senior managers* on the one hand and of *energy staff* on the other– are not necessarily in conflict with each other. Indeed one key to successful energy management is to develop ways that, as far as possible, allow these two sets of aims to overlap. The way for you, as energy manager, to achieve this is to introduce two additional aims, one for senior managers and one for energy staff.

The additional aim for *senior managers* is:

● to obtain appropriate management information on energy consumption.
The additional aim for *energy staff* is:
● to demonstrate effective performance to senior and top managers, budget holders and end users.

If you can provide *senior managers* with information they can use to achieve their aims, and if you are able to convince them that you are producing significant benefits for your organisation, then they are much more likely to support your energy management activities.

The need for action

As energy managers you will be only too aware of the need for action. Nevertheless, to convince others it is helpful to have a simple mission statement.

Improved company performance

Industry, commerce and the public sector spend over £13 billion each year on energy. Yet this could be reduced by a fifth through improved energy management. Your energy spend is not an unavoidable overhead - it is a controllable cost, perhaps your largest one.

Improved environment

Today, saving money is not the only reason for cutting your energy consumption. Growing public concern and increasingly stringent legislation mean that the environmental impact of your organisation's energy use must be considered. Energy use contributes to global warming, one of the greatest environmental challenges facing the world. Energy use in buildings produces half of the United Kingdom's CO_2 emissions. Energy efficiency is one of the quickest and most cost-effective ways to reduce this threat.

A new British Standard on environmental management systems was published in April 1992 which spells out how your organisation should set about auditing its environmental performance. Reviewing your energy consumption and integrating energy management into your organisation is a good place to start a wider programme of environmental management.

Senior managers' aims include:
● saving money
● increasing efficiency or profitability
● professional development

Energy management aims:
● monitoring energy consumption accurately and appropriately
● setting consumption targets
● identifying and correcting faults
● motivating staff to conserve energy through good housekeeping
● identifying and implementing energy saving measures

BS7750:1992, *Specification for Environmental Management Systems*, British Standards Institution, London.

2

ENERGY MANAGEMENT MATRIX

This matrix has been devised to:

● help you identify and describe the current priority attached to different aspects of energy management in your organisation
● indicate alternative ways of organising energy management.

The rows of the matrix represent increasing levels of complexity or sophistication in dealing with six key management issues. Moving up the matrix signifies an increasingly mature and formal approach to handling energy management activities and implies increasingly 'good' practice.

Energy Paper 50, *Energy Conservation Investment in Industry: an Appraisal of the Opportunities and Barriers*, HMSO, London, 1983.

The Armitage Norton Report

In July 1983 the Department of Energy published a report entitled *Energy Conservation Investment in Industry* (The Armitage Norton Report). Much of the emphasis of the report was on an organisation's management approach to energy matters.

The report identified two key barriers to energy management:

● the low status of energy management
● the low priority of energy investment.
  It also drew attention to three significant organisational issues:
● energy policy
● energy management structures
● energy reporting systems.

An important insight of the report was the suggestion that these three aspects of an energy management programme could be out of phase; a scale of 0 to 4 being used to measure the maturity of each aspect. In 1984, Peter Harris converted this idea into a matrix. Eclipse developed the Energy Management Matrix overleaf to include three other key organisational issues.

How to use the matrix

To use the matrix you need to identify those issues that are currently more critical or more in need of review than others. Detailed guidance on how to do this is given on page 7.
In summary you should:

● locate your organisation on the matrix
● concentrate on those columns where you can make the most progress
● identify obstacles to progress and decide how these might be overcome
● identify opportunities for improvement and decide how these can be exploited
● involve others, both senior managers and end users, in this process.

Level	Energy policy	Energy manage-ment structure	Energy reporting system
4	A formal system is introduced to direct middle management attention to energy matters.	Creation of an energy management structure, involving most top and operating management levels, and incorporating such appointments as 'energy wardens' or 'energy supervisors' on the factory floor.	Sub-metered, related to production volumes and other related variables.
3	Top management recognises the potential for cost savings and exhorts middle management attention to energy conservation	Designation of someone, at site level, with full-time responsibility for energy matters.	Unit used, based on sub-metering.
2	Energy matters become explicitly regarded as the responsibility of a works manager, or other technically-based staff.	The designation of a member of staff, at site level, with specific, but part-time responsibility for energy matters.	Unit used, at the level of aggregate consumption based on supply metering.
1	Top management declares an active commitment to energy matters.	An energy conservation grouping of managers involved in energy matters, at site or plant level.	Monthly or more frequent reports, in cost terms only sometimes involving meter reading to estimate cost between billing dates.
0	No explicit policy	No explicit structure	Costs collected at longer intervals, including the situation where energy costs are consolidated with other costs as part of reported product, process or overhead costs, and normally based on bills received.

P. S. Harris, 'The Armitage Norton Report', *Energy Users Research Association Limited*, Bulletin No. 44, February 1984.

Description of the matrix

The matrix provides a quick, easy to use but effective method to establish your **organisational profile**. Each column of the matrix deals with one of six organisational issues: policy, organisation, motivation, information systems, marketing and investment. The ascending rows, from 0 to 4, represent increasingly sophisticated handling of these issues. Your aim is to move up through these levels towards current 'best practice' and, as you do so, to develop balance across the columns.

Organisational profile

When you draw a line through each of the matrix cells which best describes your organisational approach to energy management, you will probably find that some aspects are more advanced or sophisticated than others. This is not unusual. Your organisational profile will show you those aspects where some further attention is required to ensure energy management is developed in a rounded, effective way. Only by developing energy management evenly will you be sure of getting the most out of your investment.

ENERGY MANAGEMENT MATRIX (© BRECSU 1993)

Level	Energy Policy	Organising	Motivation	Information systems	Marketing	Investment
4	Energy policy, action plan and regular review have commitment of top management as part of an environmental strategy	Energy management fully integrated into management structure. Clear delegation of responsibility for energy consumption	Formal and informal channels of communication regularly exploited by energy manager and energy staff at all levels	Comprehensive system sets targets, monitors consumption, identifies faults, quantifies savings and provides budget tracking	Marketing the value of energy efficiency and the performance of energy management both within the organisation and outside it	Positive discrimination in favour of 'green' schemes with detailed investment appraisal of all new-build and refurbishment opportunities
3	Formal energy policy, but no active commitment from top management	Energy manager accountable to energy committee representing all users, chaired by a member of the managing board	Energy committee used as main channel together with direct contact with major users	M&T reports for individual premises based on sub-metering, but savings not reported effectively to users	Programme of staff awareness and regular publicity campaigns	Same pay back criteria employed as for all other investment
2	Unadopted energy policy set by energy manager or senior departmental manager	Energy manager in post, reporting to ad-hoc committee, but line management and authority are unclear	Contact with major users through ad hoc committee chaired by senior departmental manager	Monitoring and targeting reports based on supply meter data. Energy unit has ad hoc involvement in budget setting	Some ad hoc staff awareness training	Investment using short term pay back criteria only
1	An unwritten set of guidelines	Energy management the part-time responsibilty of someone with only limited authority or influence	Informal contacts between engineer and a few users	Cost reporting based on invoice data. Engineer compiles reports for internal use within technical department	Informal contacts used to promote energy efficiency	Only low cost measures taken
0	No explicit policy	No energy management or any formal delegation of responsibilty for energy consumption	No contact with users	No information system. No accounting for energy consumption	No promotion of energy efficiency	No investment in increasing energy efficiency in premises
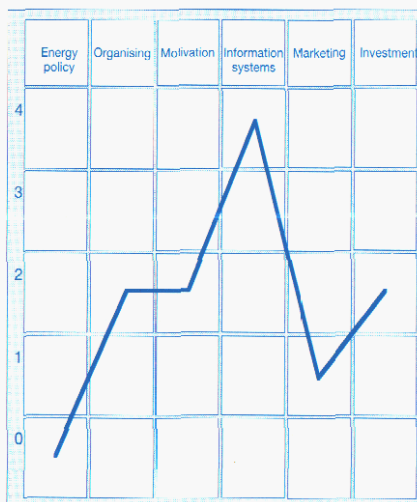
Example of an unbalanced matrix
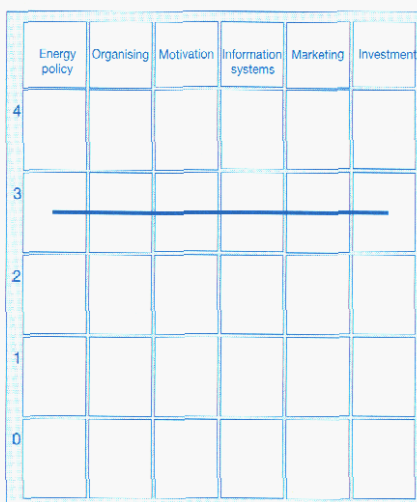
Example of a balanced matrix

Level 0

Energy management is non-existent. There is no energy policy, no specific 'energy' staff and no formal delegation of responsibility for energy use. Energy consumption is not monitored and there is no programme of promoting awareness of energy use within the organisation.

Strength: none.

Weakness: substantial lost opportunity to reduce energy consumption and wider environmental impact.

Level 1

Although there is no explicit energy policy, the organisation does employ an energy specialist. This person has created a rudimentary information system based on fuel invoices but any reporting is only within his or her department. The energy specialist promotes an awareness of energy matters through informal contacts with those directly responsible for energy consumption and responds to requests for advice on an ad hoc basis.

Strength: specialist staff recognise the importance of energy management.

Weakness: energy management relies solely on informal relations with users, with little or no corporate priority (and resulting finance) accorded to the activity.

Level 2

Senior managers accept the importance of energy management but, in practice, there is little active commitment or support for energy management activities. Energy staff are usually based in a technical department and report to an ad hoc committee of people from other departments. The effectiveness of energy management activities is restricted by the interest and enthusiasm of these committee members.

Strength: energy staff are a formal focus for energy management initiatives.

Weakness: there is still insufficient support from top management, typically with any project being considered individually rather than as part of a programme.

Level 3

Energy management is taken more seriously by senior managers and is woven into formal managerial structures. Consumption is assigned to cost centre budgets. There is a comprehensive information system and an established system of reporting. There is also an agreed programme for promoting energy management and investing in energy efficiency.

Strength: energy is no longer regarded as a marginal issue and is the concern of the whole organisation.

Weakness: energy management is still not fully integrated and most managers regard it as a technical function rather than as part of their own responsibility.

Level 4

There is clear delegation of responsibility for energy consumption throughout the organisation. The energy manager regularly exploits formal and informal channels of communication to influence users' behaviour and promote energy efficiency. There is a comprehensive information system and energy consumption is fully integrated into management accounting. Actual performance is monitored against targets and the benefits of energy efficiency measures calculated. Achievements in energy management are well reported and energy consumption is related to its impact on wider environmental issues. The managing board is committed to energy efficiency.

Strength: energy management is fully integrated into management systems.

Weakness: the activities of the energy staff could become bureaucratized.

Using the matrix to promote organisational change

If you are going to help bring about the organisational changes and development required to improve energy management, you need a way of:

- identifying the issues with the highest priority for you
- reviewing how well you personally are performing
- assessing the quality and level of support which you are being given
- focusing on your present situation and identifying where you want to get to next.

Establishing your organisational profile

There are ten straightforward steps which you can take to bring about improvements to energy management in your organisation:

1 Make a photocopy of the matrix. Consider each column, one at a time. Mark the place in each column which best describes where you think you are currently located. Place your mark in the appropriate cell or between cells if you think this is more accurate.

2 Then join up your marks across the columns to produce a graph line. This is your Organisation Profile. It will give you an overall indication of how balanced energy management is in your organisation.

Don't worry if the Profile is uneven. This is the case in most organisations. The peaks represent where your current effort is most sophisticated. The troughs indicate where you are least advanced.

3 Make a second photocopy of the matrix and ask your line manager to repeat the process, marking it up in the same way.

4 Compare your Organisational Profiles. Where they disagree, discuss your assessments to see if you can reach an agreed compromise position. If you can agree the Profile, draw it on a third photocopy. If you can't agree, draw both Profiles on and label them as your separate views. Do not regard failure to agree as a problem. It simply reflects your different standpoints and understanding.

[Even if you agree, you may find it instructive to ask others to fill in the matrix, particularly if they are involved with the services you offer. Their Profiles will tell you how energy management is seen by others in your organisation. This can help you clarify what outsiders see as your strengths and weaknesses. Where you have collected this information, include their labelled Profiles on the third photocopy.]

5 Working on your own, decide which columns contain issues that are most important in your own particular circumstances. Choose two columns where you would most like to see a change or improvement. Then list what you see as the five main obstacles impeding your progress to the next level up in each of these columns. Then identify three key opportunities for improving your performance.

[Note that it will not always be the columns with the lowest score which warrant immediate attention. If the obstacles you identify seem insuperable from where you stand, or if there are no obvious opportunities for improvement, then you may be better off investing your limited time and attention elsewhere. Remember too that others, above you in your organisation's hierarchy or located in other departments, may be able to remove obstacles or to create opportunities which are simply not open to you. Try to identify where this is so and what they need to do if they are to help.]

6 Ask your line manager to repeat this process.

7 Again compare your lists. If you disagree, try to reach a consensus. If you can't, simply amalgamate your lists of obstacles and opportunities.

8 Pass a photocopy of the matrix to your senior managers and ask them to repeat the exercises done by you and your line manager. Ask them to return the results to you for collation. Include their Organisational Profiles on the third photocopy.

9 Write up the collated results in a report to your senior managers. Include all the labelled Organisational Profiles on the matrix and the collated lists of obstacles and opportunities. End with a set of recommendations proposing how identified obstacles can be overcome and how opportunities can be exploited. Where you are unable to do this, table a series of questions for senior managers asking what they believe needs to be done to improve the present situation.

10 Use the dialogue started by these exercises to construct, in negotiation with your senior managers, an Action Pan for improving energy management over the next twelve months. Include some interim milestones and specify:

● who is responsible for taking each of the actions listed, and
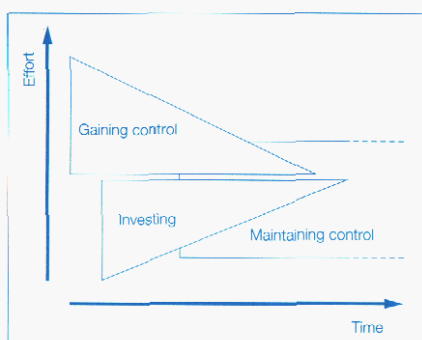● how progress is to be measured at the end of the period.

One possible method for measuring progress is to use the Energy Management Matrix at the end of the period to identify how the Organisational Profile has changed.

Once you have used the matrix to identify an issue on which you want more information, then you can turn to the relevant chapter in this Guide for further advice.
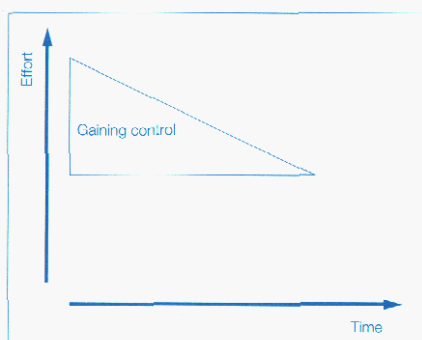
3

STRATEGIC APPROACH

Organisations can adopt a variety of approaches to energy management. Where energy management is located, how it is staffed and funded and how it relates to other parts of the organisation – these are questions to which there is no single answer, but a range of options. The strategy you adopt will depend on your individual situation; particularly on the corporate culture of the organisation you are working in, and on the stage it has reached in energy management.

Phasing energy management
There is a clear sequence to developing energy management activities. Any organisation, whether introducing energy management for the first time or upgrading its existing activities, needs to be aware of this and adapt its effort accordingly. This sequence can be visualised as series of overlapping phases:

Phase 1: gaining control over energy consumption
Phase 2: investing in energy saving measures
Phase 3: maintaining control over consumption.

Phasing energy management over time

Phase 1
The first aim of energy management should be to gain control of consumption and costs by identifying your organisation's major users of energy and introducing 'no cost' ways of avoiding waste.
● *Purchasing strategies:* Review fuel choices and tariff selection to make sure that the most appropriate energy sources are being exploited and that they are being bought at the right prices.
● *Operating practices:* Review boiler room, heating, lighting and ventilation control strategies to ensure that existing plant and equipment is being operated at maximum efficiency.
● *Motivation and training practices:* Review energy awareness-raising campaigns and tailor training programmes to ensure that adequate guidance is given, throughout your organisation, on appropriate 'good housekeeping' practices for all individuals and groups whose actions can affect consumption.

Phase 1: gaining control over consumption

Phase 2
Once the operation of existing plant and buildings has been brought under control, and obvious excess consumption has been curbed, you can turn your attention to investing in energy saving measures which cost money.
● *Investment practices:* Review the opportunities for investing in increased energy efficiency and rank these in terms of the capital expenditure required and their predicted rates of return.

Plan a programme of work, based on funds available, which will maximise the return on investment, in order to establish the value for money of energy management activities and generate savings which can be re-invested.

Typically, in the initial stages of Phase 2, this is likely to mean restricting investment to low or medium cost measures. However, once opportunities for easy savings have been implemented, you will need to press for investment to be made with slower rates of return. [See Chapter 9: Investment]

It might seem that an organisation would eventually reach a point where extra investment produced no further savings. In reality new and more efficient technologies will call for supplementary investment.

Phase 3

As soon as Phases 1 and 2 are under way you will need to act to maintain control and protect your investment. This means establishing and operating an effective energy management information system which might involve a computerised monitoring and targeting system.

● *Energy management information:* Review data collection, processing and feedback procedures and mechanisms to ensure that information is delivered to those who need it, on time and in a form which supports their managerial decision-making so that:

● control over consumption is maintained
● achieved energy savings are sustained
● existing energy saving investments are protected.

An ongoing process

The time taken over Phases 1 and 2 depends on the extent of the problems you face and the resources your organisation is willing or able to devote to them. If insufficient expertise and money are invested, then an organisation is likely to fail to reduce or gain control of its energy consumption. In some cases, it may even slip backwards.

Without continual support from senior and top management, adequate funding and the right quality of energy management staff, control will be lost. If this happens, then an organisation may slip back to a position worse than it occupied before it started trying to save energy. For, having once experienced failure, it will be more difficult a second time around:

● to convince senior management to make the further investments of time and money required for energy management to succeed
● to motivate other staff to treat energy saving seriously.

In practice Phases 1 and 2 are never entirely completed. Gaining and maintaining control is a dynamic process. Over time, you will find that you regularly have to re-establish control as users become less energy conscious or control systems need re-setting. Likewise, as technology changes, the benefit of investing in new measures needs to be reappraised continually.

Understanding change

As an energy manager you will be involved in introducing changes into your organis-ation. Organisational change tends to follow a fairly predictable cycle:

● a desire to improve performance stimulates action,
● uncertainty gives rise to creative insight
● rethinking the problem allows you to change, and
● improved control can finally lead to routine.

The initiation phase begins when people in an organisation want to bring about change or improve performance. An action is taken which perhaps involves some risk. This produces uncertainty which in turn can result in misgivings and abandoning the initiative.
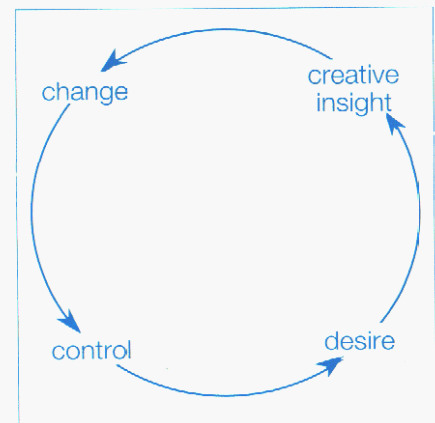
But if the people involved can tolerate contradiction and uncertainty they will begin to re-frame the problem and enter a phase of creative insight in which the previous
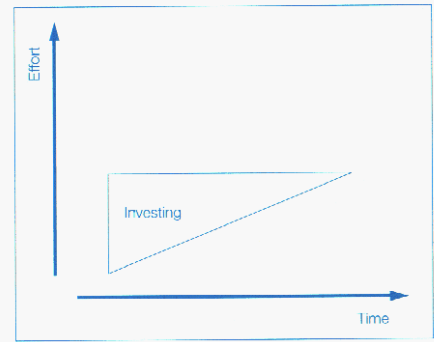
Phase 2: investing in energy saving
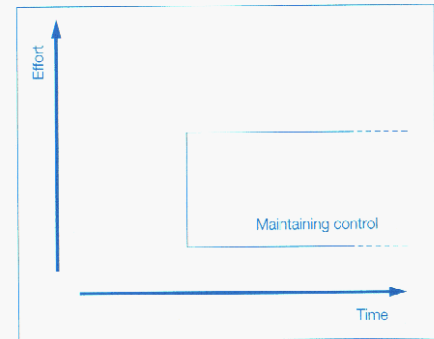
Phase 3: maintaining control

Organisational change tends to be cyclical

R. E. Quinn, *Beyond Rational Management*, New York, Jossey-Bass, 1988.

contradictions are integrated and solutions discovered. This new understanding can become a routine as things settle down. The organisation may then stagnate until someone initiates new changes and the organisation begins the cycle again.

A major aspect of your job as energy manager is to help move peoples' attitudes and behaviour in the direction of energy saving. The kinds of questions you need to ask are:

- to what extent can you exploit the existing culture of your organisation?
- are there ways round organisational constraints that impede progress?
- can you or should you attempt to change the organisation?
- to what extent should you yourself change and accommodate to the organisation?

Corporate culture

To answer these questions you need to understand the culture of the organisation in which you are working. Energy management has to operate within the collective climate of attitudes and customs that form the culture of your organisation. These attitudes include beliefs about organisational purpose, the location of authority and preferred styles of leadership. Customary ways of gaining compliance, of allowing discretion, of evaluating performance and motivating staff are all important if you are attempting to influence and alter people's attitudes and behaviour.

There are two schools of thought here. One is a belief that since organisations are complex, only a flexible approach to energy management that accommodates to a specific organisational culture will be successful. The opposing view is that organisations are too complex to be understood fully and that energy management systems should be sufficiently robust to operate within any culture. Whether a flexible or robust approach is more or less suitable will of course depend on your particular circumstances. In practice, however, no matter how robust you attempt to make your energy management systems your success will depend on how well these are attuned to your organisation's culture.

The cultural climate of an organisation will change according to the degree of uncertainty in its environment and according to the time scales within which it needs to operate. For example, an organisation operating day-to-day in an uncertain market will have a very different style to an organisation in a stable market operating with long term horizons.

Using this idea in a grid produces four 'typical' cultural types: entrepreneurial, team, hierarchic and market.

This notion of corporate culture is fairly abstract so case studies of four organisations – Manchester Airport, Sainsburys, British Gas and Sheffield Council – are used here to illustrate the differences that can exist. The four organisations were chosen because they have a reputation for good practice, yet the remit, style, location and funding of energy management in each of them varies considerably.

Manchester Airport, for example, located energy management in their Audit Department and their Energy Manager acts as a trouble-shooter, concentrating on cutting waste and identifying opportunities for energy saving investment.

In contrast, at Sheffield Council the Energy Unit is a seven member team within Design and Building Services. It operates as a fee-earning consultancy, selling its services to council departments and schools but with no budget of its own for investment in energy efficiency.

Team	Entrepre-neurial	high
Hierarchic	Market	low

long | short
planning

uncertainty
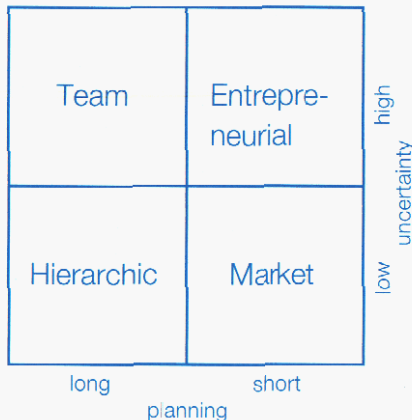
Grid of the four 'typical' cultural types

1 Entrepreneurial culture

Innovation and growth are the features that distinguish an entrepreneurial culture. The organisation is outward looking, planning is short-term and there is a tolerance of uncertainty. Leadership is charismatic and accountability operates through personal contact. People rely on intuition and hunches. They make decisions quickly, but continue to gather information and adjust plans as they go along. These organisations have flexible structures and people are motivated by variety and risk. Your optimum strategy as energy manager would be to:

- gain the patronage of the chief executive to operate across the organisation
- concentrate on major energy users and develop an investment programme that will give quick returns.

2 Team culture

Participation and cooperation are the features that distinguish team cultures. The organisation is inward looking, planning is long-term and there is a tolerance of uncertainty. Leadership is unobtrusive and supportive and accountability operates through meetings. In making decisions, people take time to seek out diverse opinions and search for solutions that integrate the various positions. These organisations have flexible structures and people are motivated by collaboration. Your optimum strategy as energy manager would be to:

● set up an energy efficiency committee with representatives from all user departments to devise an energy policy
● appoint energy representatives to involve people in implementing this policy.

Sheffield Council – an example of team culture
Sheffield Council is also operating in an uncertain world where government legislation is changing the role of, and funding for, the Energy Unit. Yet the demands for immediate action on energy use are much less pressing than at Manchester Airport and the Unit's approach is to patiently build relations with potential 'clients' within the Council.

3 Hierarchic culture

Structure and control are the features that distinguish hierarchic cultures. The organisation is inward looking, planning is long-term and there is a preference for certainty. Leadership is conservative and authority located in rules. Accountability is formalised by systems of representation. In making decisions, people tend to take a long time to gather and analyse information, the objective being to reach the single optimal solution. These organisations have ordered structures and people are motivated by predictability and security. Your optimum strategy as energy manager would be to:

● ensure that energy management is clearly located in the structure with established procedures of accountability and reporting
● set up a comprehensive information system to monitor consumption and report faults.

British Gas – an example of hierarchic culture
At British Gas, the Energy Manager operates in a stable environment in which targets set for individual buildings and consumption can be reliably monitored. Regional and national committees coordinate energy management across the organisation and are standardising procedures in the various regions.

4 Market culture

Productivity and achievement are the features that distinguish market cultures. The organisation is outward looking, planning is short-term and there is a preference for certainty. Authority is located in 'the boss', but there is a high degree of delegation and decentralisation and morale is usually high. People tend to make rapid and final decisions and rely on competence and rational judgement to guide action. These organisations have ordered structures and people are motivated by achieving sensible targets. Your optimum strategy as energy manager would be to:

● identify cost centres within the organisation responsible for managing their own energy within a defined budget
● devise routine procedures for reporting back to users their energy consumption against target.

Sainsbury's – an example of market culture
At Sainsbury's, energy consumption is the responsibility of each store manager. The Energy Manager lays down standards to which stores are built, sets targets which form the basis of a store's energy budgets and monitors consumption. Energy management is given a high profile at board level and the control of energy costs is seen as having an important impact on profitability.

People are not equally comfortable in each of these cultural climates. A person with a need for achievement will prefer a market culture which demands immediate action but where certainty is high. A person with a need for affiliation will most likely prefer a team culture where there is less need for action and less certainty and the emphasis is on co-operation. Particular managerial styles will be more or less suited to each culture.

This relationship between corporate culture and managerial style has important implications for energy managers. Identifying the kind of culture in which you have to operate can help you decide the most appropriate strategy and style to adopt in representing your work to senior managers and in motivating people to save energy.

4

ENERGY POLICY

Many organisations, even those well advanced in energy management, have not as yet felt it necessary to have a formal energy policy. Typically, within these organisations, there is a general understanding of responsibilities and accountability for energy consumed but no attempt has been made to write these down.

But as long as commitment to saving energy is left to operate on an unofficial or ad hoc basis, then it can be derailed or its impact lessened by changes in personnel, whether amongst top managers, senior managers or even energy management staff themselves. Where commitment is informal, the loss of a champion or key decision-maker, at any of these levels, can undermine your energy management activities.

In addition, unless commitment is formally endorsed, there is also a danger that other, temporarily more pressing, priorities will crowd out the attention given to controlling energy consumption, whether in terms of managerial time or the allocation of staff and resources.

Furthermore, unless responsibilities and accountability for energy consumption are clearly written down and routinely distributed to all relevant employees, they cannot easily be included in staff performance evaluations.

Without a written policy, an organisation's attempts to manage its consumption of energy will be vulnerable to:

- changes in personnel, and/or
- alterations in perceived priorities.

Purpose

A formal written energy policy acts both as:

- a public expression of your organisation's commitment to energy conservation and environment protection
- a working document to guide your energy management practices and provide continuity.

These two aims suggest that the policy should be published in two parts. Part 1, the expression of commitment and summary of general principles is for publication and dissemination. Part 2, the detailed operating policy, may contain commercially sensitive information and is for internal circulation only. [A sample energy policy is presented in Chapter 11]

For all of these reasons, it is in your organisation's best interest that its support for energy management is expressed in a formal, written declaration of commitment, accompanied by a set of stated objectives, an action plan for achieving them and a clear specification of delegated responsibilities.

There are four additional reasons why you, as energy manager, should promote the adoption of a formal, written energy policy by your organisation.
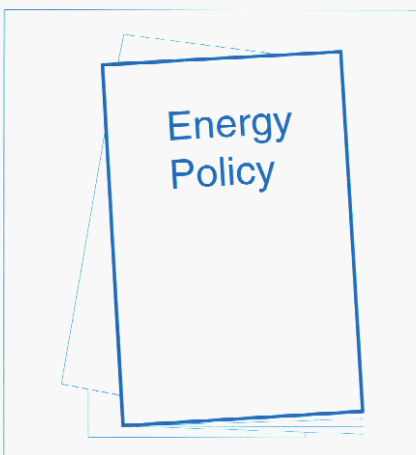
Energy Policy

An energy policy for your organisation

1   You are more likely to be successful in saving energy if both you and your organisation have a clear statement of what you are being asked to accomplish.
2   Your organisation will appreciate the value of your work more if it is able to measure your performance against an agreed programme and set of targets.
3   Your activities will be more effective if they are adequately staffed and funded.
4   Your activities are more likely to be accepted and supported throughout your organisation if they have formal backing from top management.

Energy policies in perspective

Energy management is only a means to a particular end – safeguarding your organisation so that it can pursue its activities without being hindered by disruptions to its energy supply or by having to bear unnecessary energy costs.

Your organisation cannot operate without access to adequate and affordable supplies of energy. Even so, policy objectives in this area will be of secondary importance to whatever your organisation chooses to define as its overriding goals. As these change with time, so will the importance attached to energy policy.

Saving energy should not be pursued without due attention to its effects on other aspects of your organisation's operations, e.g. staff morale, productivity and building-related health risks. Other, wider issues such as the depletion of finite resources, pollution and environmental degradation also need your attention. As a guiding principle, be careful to formulate and then implement energy policy only in ways that protect and enhance your organisation's primary objectives and other interests.

At present, because of growing concern about environmental issues, energy policy is receiving increased attention. This is a good time to press your organisation to adopt a *corporate* energy policy. If it already has, then you should be encouraging co-ordination of this policy with your organisation's corporate *environmental strategy* if you have one.

Sample energy policy

No two organisations are exactly alike. So you need to develop your policy to reflect your own circumstances as well as your organisation's specific activities and priorities. Chapter 11 contains a sample energy policy. This has been prepared to support organisations which have made a 'Corporate Commitment' to energy efficiency in response to the Energy Efficiency Office's initiative launched in 1991.

Compare this sample policy with your own organisation's policy statement, if you already have one. There may be parts of it which you can, with suitable amendment, incorporate in your own. If you do not already have a policy statement, try using the Contents Guide below to draft one. Or amend the sample statement in Chapter 11 to suit your own particular circumstances.

Contents Guide

Part 1

1   Declaration of top management's commitment to, and senior and middle management's involvement in, energy management
2   Statement of policy
3   Statement of objectives, separated into short and longer term goals

Part 2

4   An action plan, specifying a timetabled programme of work
5   Costed resource requirements, including staffing complement, investment and training needs, necessary to achieve the programme
6   Assigned responsibility and accountability for actions outlined, specifying individuals by name and post
7   Description of any energy management committee's remit, structure, membership and reporting mechanisms
8   Named committee representative for each department and specification of internal and external lines of communication
9   Statement of review procedure, defining milestones and mechanisms for assessing overall progress and value for money, as well as appraising the performance of individual members of staff.

Policy
Document
Contents

Declaration of commitment
Objectives
Action plan
Resources
Accountability
Review procedures

Possible contents of a policy document

Devising the policy

How the energy policy is actually drafted will depend to some extent on your organisation's corporate culture. It may also be affected by your own management style. However, you are more likely to get wide acceptance for the policy if all the parties affected by it have been given the opportunity to contribute to its formulation. The policy document may be collated and drafted by you as energy manager but it should be vetted and amended by an inter-departmental committee. Departmental representatives should be invited to make submissions to this when the policy is first formulated and then again whenever it is reviewed.

This consultation period is the time to start building commitment to the policy throughout your organisation. Ideally, you want to make each vested interest group feel that the policy is reasonable and that they have a stake in it. Above all, try to avoid creating a situation where any group feels that the policy is being imposed on them without consultation.

Ratifying the policy

Once the policy has been formulated, it is important that it be formally adopted and ratified within your organisation. Without this, you may have difficulty gaining access to the funds you need to support your energy management activities.

First the policy must be formally endorsed by your managing board. Then copies of the document should be circulated to all the departments and interest groups concerned and meetings should be held to explain the policy and its implications. Again, your aim here is to build good relations between the energy management staff and those able to influence the outcome of your programme of work. These meetings should also be used to identify, in detail, any marketing or training activities required to make sure the policy gets implemented.
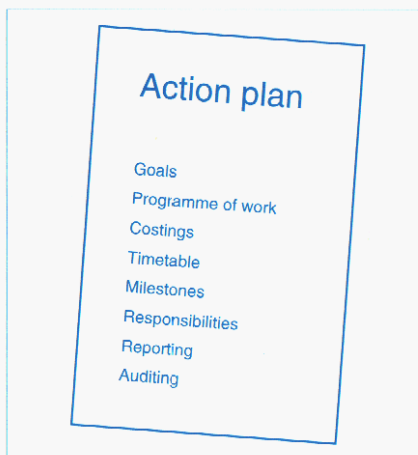
Actions to be included

First and foremost you should ensure that you are effectively addressing each of the activities required for the phase you have reached in your programme of work on energy management. [See Chapter 3: Strategic Approach] Only once you have all of these successfully in hand should you look around for other initiatives.

If your organisation already has a rolling programme of energy management activities, it is probable that these are currently restricted to trying to save energy in its premises. But there is growing pressure on you not just to reduce energy costs but also to improve your organisation's environmental performance. In response to this, you may need to widen your role, beyond simply intervening in the procurement and maintenance of buildings, to cover other areas of energy consumption in your organisation.

Areas which could benefit from the experience you have accumulated as energy manager include:

- pollution control in terms of CO_2 and cfc emissions and air quality both inside and outside buildings
- transport because of the fuel consumption involved
- purchasing due to the embodied energy content of materials
- waste management because of the energy implications of disposal, reclamation and recycling
- facilities management and land use planning due to the transport energy consequences of choices about building locations.

Most of these areas lie outside the current remit held by energy managers. Some may already be the responsibility of others. But the understanding and experience you have acquired from trying to save energy in buildings is relevant to them. You should make sure that you are involved, at least at the level of formulating policies, in integrating these areas of activity within your organisation's overall environmental strategy.

Action plan

Goals
Programme of work
Costings
Timetable
Milestones
Responsibilities
Reporting
Auditing

Possible contents of an action plan

Example of Leicester City Council

Leicester City Council (which spends £2.5 million a year on energy in its buildings) published an Energy Action plan in 1990 which outlines 80 actions for meeting a target of reducing energy consumption by 50% by the year 2025.

The plan defines the lead officer responsible for each action and the time scale to complete the action. The second annual progress report, published in 1992, suggests that energy consumption was reduced by 2.5% in the previous year.

Follow up

What you decide to take as your next steps depends on:

- the phase you have reached in your programme of energy management
- the issues which you have identified, from the matrix, as those you need to tackle next.

Wherever you are at present, your constant aim should be to develop a *strategic* approach to energy management. This involves you in building a long term rolling programme of investment and organisational development that will eventually integrate your work on energy management both:

- within your organisation's environmental management systems, in particular, and
- throughout its mainstream, day-to-day, managerial decision-making as well.

But it is important not to be over-ambitious. Work incrementally, only taking on as much work as you can cope with within your current staffing and funding capacities. And only accept those tasks which you know you have a fair chance of completing successfully. In particular, avoid making promises you cannot keep since this will:

- damage your reputation for effectiveness and for providing value for money
- deter people from using your services again, and
- make further funding for energy management activities more difficult to find in future.

Future proposals

Overview
Strategic objectives
Short term goals
Medium term goals
Long term goals
Rolling programme of work
Funding arrangements

Possible content of future proposals

5

ORGANISING

Energy management ranges over the whole organisation and to be effective as an energy manager you need access to all parts of the organisation. But energy management has to be located somewhere. There are five options:

- technical department
- personnel department
- finance department
- chief executive's office
- outside consultants.

Location of energy management

Saving energy has tended to be seen as a technical activity and you may now find yourself located in a technical section within your organisation. This may be a good base for gaining control in Phase 1 of an energy management programme but it is less appropriate for training or energy information activities.

Personnel may be a suitable location for the motivation and training activities and a finance section may, in the long term, be a good base from which to operate the financial control and accounting procedures required in Phase 3. But both locations have disadvantages in terms of technical support and credibility.

The chief executive's office may provide the high profile and access required to kick-start energy management initially. But, in the longer term, if you want energy management to be integrated into mainstream management throughout the organisation, then this may not be the best location.

The final option is to employ outside consultants who can provide wide experience and expertise. This may be the best option in technical situations when consultants can be used to support internal energy staff but it lacks the network of relationships and day-to-day contact that is crucial for informing and motivating staff.

In practice, there may be no single ideal home for all energy management activities and the optimum location may need to reflect this, altering over time as your organisation moves from one phase of its energy management programme to the next.

Each option has its own advantages and shortcomings. Whichever position you find yourself in you will have to plan accordingly. An important question is:

- Should all energy staff be kept together in a combined unit?
- Or is it more appropriate for them to be dispersed across the organisation?

In terms of line management, a single unit within a particular section has the shortest chain of command and it may also offer *esprit de corps* and economies of scale. But dispersed locations with responsibilities delegated between sections may
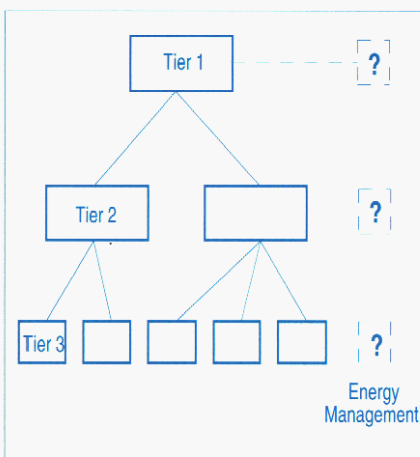
Possible locations for energy management

be more useful in the longer term as a way of integrating energy management across your organisation's activities.

Which of these options will prove to be best, not just in the short term but in the long run, will depend on the specific circumstance you find within your own organisation. If you find yourself based in a technical section, then you must work against 'saving energy' being marginalised as a specialised technical activity. Energy is an organisation-wide management issue, not a technical speciality. You must:

- make all managers understand that controlling energy consumption is one of their managerial responsibilities
- get them to accept and act on this 'new' understanding by having them account for their own energy consumption.

Top management support

As energy manager you may find you have limited status and authority. Yet typically you will have to persuade other, more powerful post holders to change the ways in which they and their staff operate. Because of this mismatch between your limited authority and the scale of your organisation-wide task as energy manager, you are unlikely to be successful unless you get full backing both from your own section head and from senior management.

Top management backing is needed, not just informally through personal endorsement and promotion, but formally through an inter-departmental committee in which all senior managers are required to commit themselves and their staff to good energy management practices.

Without this endorsement from top management energy management is likely to remain a low level activity, incapable of breaking out of your organisation's technical back waters. As a result, it will not be accepted by mainstream managers and by their staff as something which needs to be treated as part of their everyday actions and activities.

Because the post of energy manager is fairly low in an organisation's hierarchy, you are likely to find that you have much responsibility and little authority. You are required to bring about changes right across the organisation but you lack the power to enforce them.

You can increase your influence by building an alliance with a patron within your organisation who will take up and endorse energy management. This can prove particularly effective if this figure holds a high profile position such as a company chairman or chief executive. But this should only be treated as a temporary expedient.

The problem is that influence acquired in this way is informal and transient. It is neither an integral part of your post as energy manager nor of your organisation's energy management structure. If the patron leaves or turns his or her attention elsewhere, then the influence is lost and this may leave you in an even weaker position once it is recognised that your activities no longer receive the endorsement and promotion they previously had.

Remember that the information that reaches top management has three key purposes:

- to get agreement for major spending on staff or energy measures
- to provide a summary of progress
- to gain recognition and prestige for your activities.

A managerial function

Above all, the energy manager's role is a *managerial* post. Whatever your other qualities and qualifications, you should have sufficient managerial training and expertise to discharge your managerial functions. Without explicit managerial understanding and ability, you are unlikely to be effective in managing your own staff or in getting energy management accepted throughout the organisation. If you do not already have the necessary managerial experience, find out what provision your organisation makes for in-service training.
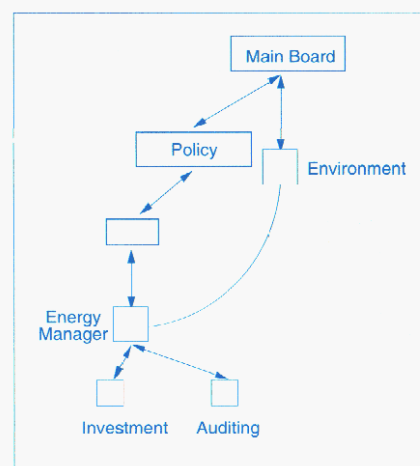

Separating investment and auditing

The qualities an energy manager needs to develop depend to some extent on the stage energy management has reached in an organisation. During Phases 1 and 2, you are likely to be effective if you have high needs for personal achievement, thrive on setting yourself short-term goals and on the positive feedback derived from achieving them. But, if you do have these qualities and you exploit them successfully, you will eventually find that you have made all the easy improvements and savings available. Then you may no longer be able to find the short term success you seek and so lack the recognition you need.

When a programme of energy management reaches Phase 3, different qualities are required of you as energy manager. Here emphasis is no longer on personal initiatives but on protecting existing investment in energy efficiency and on overseeing the operation of the installed management information system. So the personal characteristics effective in the earlier phase are less relevant. They may even prove a liability. You will predominantly be required to safeguard established systems and procedures and to maintain patterns of behaviour within prescribed limits.
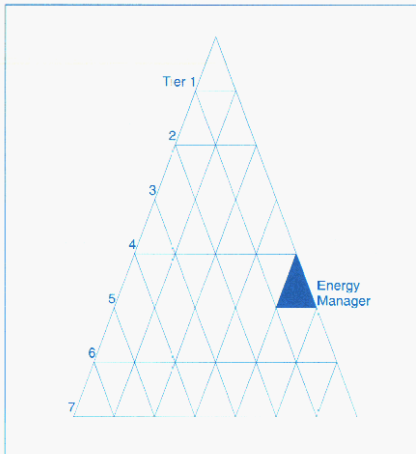
Sample job description for energy managers

Your tasks and responsibilities as energy manager are clearly wide ranging and may even vary over time as energy management becomes established. It may be helpful therefore to provide a sample job description for the role of energy manager.

1. overseeing the formulation and implementation of an energy policy
2. introducing and maintaining cost-effective ways of providing management information about energy consumption and attendant environmental pollution
3. reporting such information appropriately and regularly to the staff accountable for this consumption and to senior managers
4. introducing and maintaining efficient and environmentally benign policies and practices for the purchase and combustion of fuels
5. raising and maintaining energy awareness throughout your organisation
6. introducing and maintaining effective 'good housekeeping' and plant operating practices throughout your organisation
7. identifying your organisation's training needs for energy-related skills and understanding
8. identifying cost-effective opportunities for increasing energy efficiency – whether in new or existing premises
9. formulating an investment programme for reducing energy consumption and environmental pollution
10. introducing and maintaining review procedures for establishing the value for money of energy management activities, both to top management and other relevant staff.

Accountability

Good line management is as important as location. What is needed is:
- unambiguous delegation of responsibility for controlling energy consumption to appropriate budget holders in each section in the organisation
- one person assigned overall responsibility for co-ordinating all energy management activities and reporting regularly on how well each section is controlling the amount of energy it consumes
- clear lines of reporting and accountability to that person from energy users
- clear lines of reporting and accountability for energy management activities leading from that individual right up to top management
- a clear inter-departmental committee structure for managing energy.

You should report, at least once a month, to the head of the section in which you are located. Through this section head, you need direct access and should report at least once a quarter to an inter-departmental energy management committee. The advantage of such a committee is that it provides access to areas of decision-making affecting energy consumption otherwise denied you. Through this committee, you should report at least once a year to the main board.

Energy management in the hierarchy
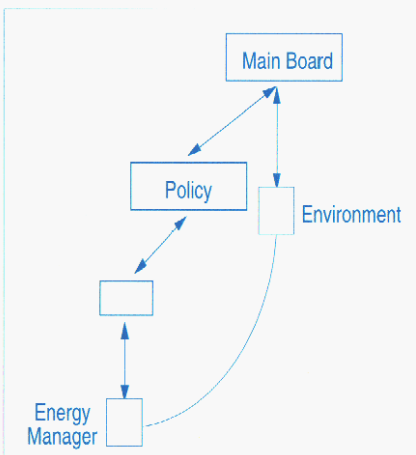
Lines of reporting for energy management

It is also desirable, as specified in BS7750:1992, to separate staff functions within energy management so that one set of individuals is responsible for making investments in energy saving measures and another for auditing the return on those investments. While both sets of staff may be immediately accountable to you as energy manager, the auditing process itself should be subject to regular external review, typically both by your section head and by the inter-departmental Energy Management Committee.

Staffing energy management

The specific number of people you require to undertake your activities depends on:
- the size of your energy bills
- the extent to which energy consumption needs to be reduced in your organisation
- the phase you have reached in your programme of energy management.

In turn, the extent to which energy consumption needs to be reduced depends on:

- your organisation's number and range of premises, plant and operations
- their current level of energy efficiency
- the existing level of energy awareness amongst staff and the extent to which they already engage in good housekeeping practices
- the adequacy of your current energy information system for supporting managerial decision-making
- the budget available to you to improve on any of this.

Clearly this means that the precise number of staff who need to be engaged on energy management activities will wax and wane over time. However, as a very rough rule of thumb you should aim to have, as a minimum:

- one full-time member of staff for each £million of energy expenditure up to £3m. Then you should have,
- one full-time member of staff for each additional £2m up to £10m and one for each extra £4m above that.

The number of staff available is not the only significant consideration here. Equally important are their areas of expertise and levels of experience. If they lack expertise and experience they are unlikely to be effective without close supervision from you. And this, in turn, can undermine your own effectiveness by preventing you from investing sufficient time in strategic thinking, internal reporting, or in promoting the value of energy management activities inside and outside the organisation.

Over the course of time, energy management activities also need to draw on a wide range of skills and expertise:
- general management
- technical
- financial
- personnel management
- education and training
- marketing.

The crucial point here is to get the right mix of skills and experience, in the right place, at the right time. At different phases in a programme of work, you will need to call on assistance from staff with specialised expertise in:
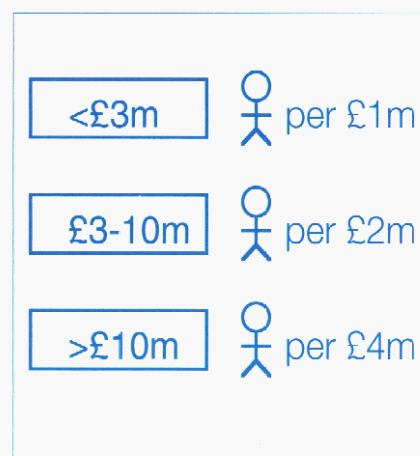
Phase 1
- energy efficiency as applied to premises, plant and controls
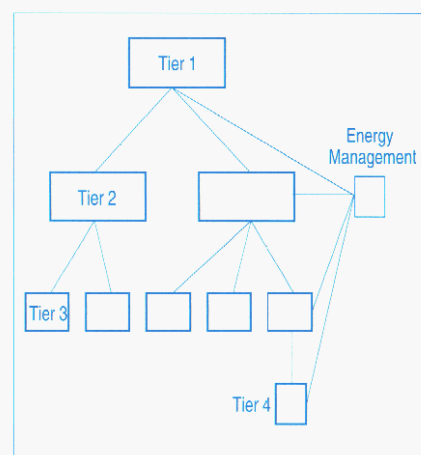- education and training

Phase 2
- accounting and financial investment appraisal

Phase 3
- motivation, incentives, promotion and publicity
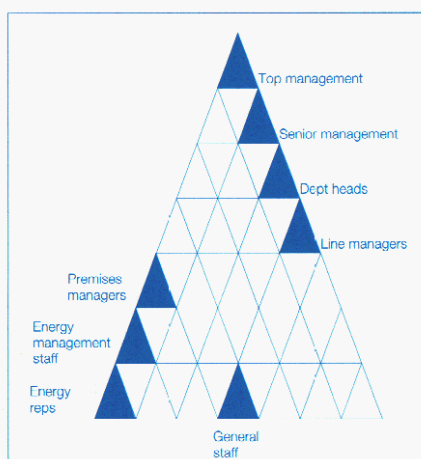- the design and operation of management information systems.

Staffing ratios for energy management as a function of energy expenditure

The range of possible working relations

6

MOTIVATION

Users of energy management services and, therefore, people you need to motivate

Energy managemment objectives

Management is a process of achieving your aims through relating to other people and most energy managers will have to try to affect people's behaviour through example and persuasion rather than by telling them what to do.

There was a view, less widely held now than say ten years ago, that managing energy is a technical issue. User interference with the functioning of a building is seen as a bad thing and the object is to minimise the impact of user behaviour by auto–mating building controls. Although it is true that better controls on boiler systems, room thermostats and timer switches can dramatically improve energy efficiency and reduce consumption, removing all environmental control from building occupants can be counter-effective. People find ways of circumventing automatic systems; they leave windows and doors open, they leave lights on when not needed and they tamper with controls and alter thermostat settings.
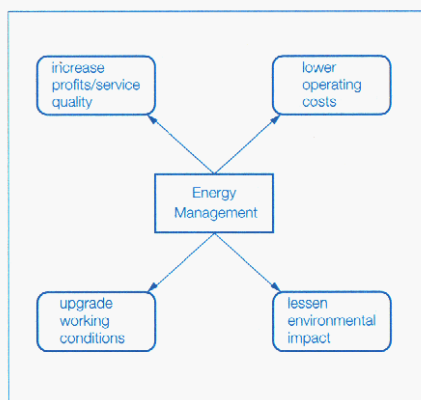
While such behaviour is an anathema to engineers, in practice, you will find that building occupiers have to be cajoled and persuaded. Being successful in saving energy is thus a question of motivating people to behave differently. How you go about this will depend primarily on your own management style and on the culture of the organisation you are working in.

Your problem is that, for most people, energy efficiency has a low priority. People only seem to take any notice of their environment when they feel sudden discomfort: if it feels too hot or too cold, too stuffy or too draughty, too bright or too dim. In terms of comfort, people want stability so it is difficult to get people to give energy management the attention it deserves. Remember, you want to use energy more efficiently to reduce costs and to reduce environmental pollution.

But to motivate people you have to translate these organisational goals into things people want to do. If you are going to gain influence with people over whom you have no authority, then they must identify with these organisational goals. To achieve this you must demonstrate that your activities and demands are 'customer driven'. Yet in many cases the opposite is happening. At present energy managers are given a target by top management of reducing energy cost by some arbitrary percentage and only a few organisations have achieved savings by motivating people to alter their attitudes and behaviour.

There are many ways open to you to increase your influence. These include:

● ensuring that people get something out of what you propose
● giving rewards, for example praise, or a good word to the right people
● extending your influence upwards and sideways as well as downwards.

Motivation

What motivates people? How do you get people to switch off unnecessary lights, or accept lower thermostat settings? How do you get them to read meters accurately

each month and send the data in on time? And how can you get agreement to invest in a measure you are convinced will save energy?

Motivation is whatever induces people to act voluntarily in a certain way and then to persist in the face of difficulty. People have basic needs (e.g. food) which if not met give rise to a drive (e.g. hunger) which results in action (a search for food). But people also do things for more complex reasons. They gain a sense of identity and satisfaction through their relationships with others. Consequently, pressure from colleagues can be more effective than financial incentives or management controls. Organisations adopting this approach show greater concern for staff morale, they devise group rather than individual incentives, they keep employees informed, for example through company newspapers, and they attempt to make the workplace a source of satisfaction.

One of the main ways of creating job satisfaction is by arranging work so that people can achieve their own aims by directing their efforts towards meeting organisational goals. In this way high performance standards can be set if people accept them as their own. The idea of 'job enrichment' is also important in motivating people. Work can be made more satisfying by allowing people greater autonomy. In this way staff are made more accountable for their own actions.

Behaviour is also influenced by expectations. People in organisations weigh up effort and reward. If the effort required of them is perceived as too great in comparison with an expected outcome, their motivation falls. It will also fall if others appear to be getting greater reward for the same effort. The ways in which your organisation rewards, or does not reward, performance will affect these perceptions and therefore motivation. Although staff appreciate that there is a clear relationship between effort, performance and reward, there is no evidence that you can motivate people to improve their performance by merely increasing rewards. Increased recognition for work well done and increased responsibility for controlling that work are more likely to be effective. The bad news is that lack of reward demotivates. Highly motivated people, frustrated through inadequate facilities and inadequate funding, become dissatisfied and stop performing.

Who you need to motivate

There are six categories of people you need to motivate. Each group will have a different interest in energy and will therefore need to be motivated in a different way.

1 Senior managers

The main motivation of senior managers is to improve the performance of your organisation through cost reduction and increased profitability. Above all, therefore, you need to demonstrate your achievements to them in these terms.

Show them what their fuel costs would be now if no energy efficiency measures had been taken in the past. Describe how these savings were achieved, whether through tariff negotiation, investment in specific energy efficiency measures or through better management. Then use an accounting procedure that quantifies all these savings, since this is a powerful tool in negotiating funding for energy management activities and further investment.

Some energy managers hitch a ride on the authority of a powerful patron. [See Chapter 5: Organising] This is not an ideal arrangement since it is dependent on the patron remaining in post and maintaining interest and support. But it is a quick way to kick-start an energy management programme and get rapid action. The problem, in terms of motivation, is that borrowed power breeds resentment and a fall from grace can undo any progress. Systematically you need to substitute patronage for a more secure base by building support throughout the organisation. In particular, you must get unit managers to see success in energy management as being their own achievement, even if won with your support and encouragement.

2 Departmental managers

The obvious way to motivate departmental managers is to make them budget holders responsible for controlling energy costs. Their motivation to reduce energy consumption will then depend on what happens to any underspend on the energy budget and how budgets are set for the succeeding year.

Motivating people:
- don't assume that money is the only or the best way to motivate
- recognition and responsibility may have a bigger impact on motivation
- financial rewards can, however, be seen as a recognition for work well done
- increasing autonomy, discretion and personal accountability will increase motivation
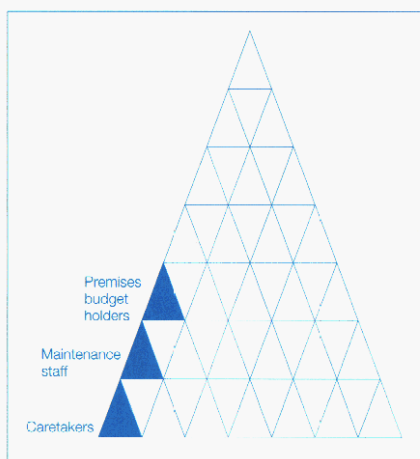- unless people want to change and are motivated to learn, training is ineffective.
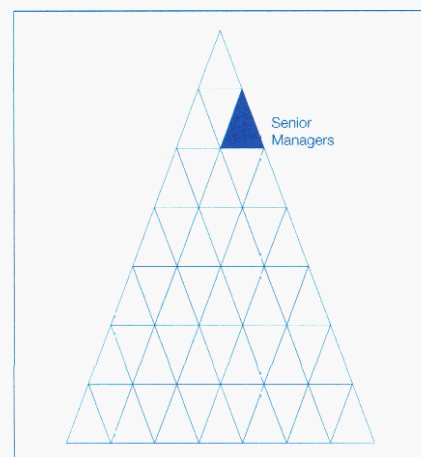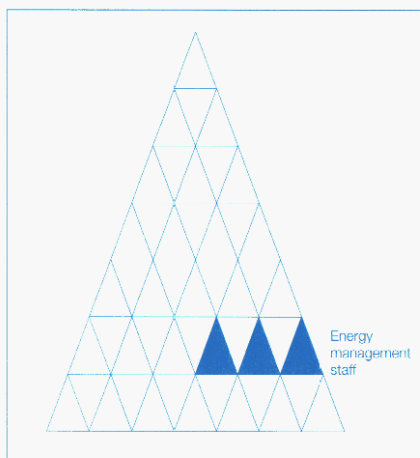

Senior managers
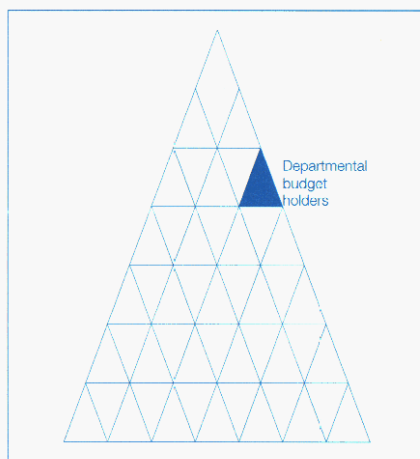
Departmental managers

Key personnel need:
- bench-marks against which to measure their performance
- backed up by timely and accurate reports on consumption
- technical support on how they can improve efficiency
- recognition of the value of what they do.

Energy management staff

In some organisations budget holders are able to retain a proportion of underspend on energy and shift it to other budget headings. So, for example, a university department is able to use savings made to finance teaching and research. In other organisations, where any surplus is clawed back and budgets for the following year proportionately reduced, there is no incentive to save, especially if budget holders are worried that energy consumption may suddenly rise again in a severe winter.

Clawing back savings is not always a disincentive, however. In some organisations cost reduction alone is a sufficient incentive to departmental managers even though all underspend is returned to the centre. The approach here is to integrate energy management into the general resource management and to report performance in the same way as all other costs.

Even in these circumstances departmental managers need ways of encouraging their staff to save energy. They will need your support and advice about what behaviour is most likely to reduce energy consumption, they will need your assistance in raising staff awareness of these issues and they will need regular feedback on how they are performing.

3 Key personnel

These people have direct control over building or plant operation, such as premises managers, caretakers and maintenance staff. To be convinced that controlling energy consumption is important, key personnel will have to measure their own personal performance and job satisfaction, at least in part, in terms of increasing the energy efficiency of the premises and plant they control.

Their success will also depend on how much spare capacity their job situation allows them and on how much autonomy and discretion they have to order their work. If they are working at full stretch to maintain the operation of plant or premises, then their main aim will be to prevent breakdowns and avoid complaints from building occupiers.

If key personnel are undervalued by senior managers, ignored unless something goes wrong, have no budget for even the most basic investment in energy efficiency measures, and are subject to blanket directives to reduce energy costs by some arbitrary percentage, then they are likely to be extremely difficult to motivate.

If, on the other hand, they have adopted energy efficiency as a personal goal, if they get support, recognition and funding from senior management, and if they get the technical back-up from you, then they are more likely to take a pride in their work.

Make personal face-to-face contact with these people. Maintain good working relations with them through regular meetings. Whether these are formal or informal will depend on the type of organisation you are working in and your own personal style of management. The way to motivate key control staff is through 'job enrichment' by helping them use energy efficiency to take pride in their work.

4 Energy management staff

How do you, personally, get job satisfaction? Unless you are motivated yourself, it will be impossible to motivate your staff and other people in the organisation. It is worth stopping a moment and reflecting on how you might answer this question. Managers are typically motivated by three basic drives: achievement, affiliation and power. You will find that, for you, one of them is predominant.

If you are project-oriented and like to achieve results, your motivation will depend on clear goals, discrete assignments, measurable outcomes. You will welcome variety to maintain challenge and you will enjoy the recognition of your senior managers. In short you are motivated by achievement.

If you need to relate to people and prefer to work in a group or team, your motivation will depend on involving others in designing and operating energy management. You will want to organise your staff as a team and will try to create an *esprit de corps* amongst energy representatives and unit managers. In short you are motivated by affiliation.

If you like to influence and direct people, you will be motivated by successfully managing others to do things for your organisation. You have a drive to command or at least guide the behaviour of others. In short you are motivated by power.

5 Energy representatives

There are obvious benefits in having energy representatives on site with specific responsibility for energy in each department or building. Ideally, such representatives should be nominated by the section in which they work. There is a value in manually reading meters. Human beings are often better at recognising problems than automatic sensors. Having someone involved in thinking about energy also has an impact on other people's attitudes and may encourage work colleagues to improve housekeeping. Ask them to keep their eyes open and report faults or ways in which energy can be saved and ask them to act as energy monitors, closing doors and windows and switching off lights.

How successful this is, in practice, will depend on your organisation and the approach it takes to energy management. Unless accepted by other staff, this monitoring role can have obvious negative effects. You may want to use energy representatives as a temporary stop-gap, dropping their monitoring function once your organisation introduces automatic metering and incorporates energy into routine resource management.

Energy representatives need training and support to perform their role and, perhaps more importantly, need praise and encouragement to persist in what can be a thankless routine task. They need to be able to see that what they do contributes to energy efficiency. They need to know exactly why accurate and timely meter readings are crucial to effective energy management, and how reporting faults can save energy. This means that you have to provide them with clear up-to-date information. And you must investigate any reported faults quickly and effectively. Once again, if you want to keep them on your side, you will need to build personal relations with them.

6 General staff

In trying to motivate staff, environmental considerations will, for many, be as significant as saving money. Calculate the impact of your energy saving on CO_2 and sulphur emissions. Present this in terms of global warming and acid rain.

Think about whether your organisation could give a proportion of its energy savings to charity. If a department underspends its energy budget, staff could nominate a charity to which some of this surplus is donated.

You may not need to speak to each member of staff personally, especially if you can provide unit managers with the necessary material to motivate their staff. If appropriate, include energy efficiency in staff induction programmes and use your organisation's newsletter to recognise each department's progress in energy conservation.

Management style

Your management style will affect staff motivation and you need to adapt your way of doing things to the culture of the organisation you are working in as well as the particular person you want to motivate. Different cultures need different styles.

- Entrepreneurial cultures demand a dynamic management style based on personal contact. They suit prime movers who are motivated by risk and change.
- Team cultures demand a supportive management style based on meetings and discussion. They suit facilitators who are motivated by collaboration.
- Hierarchic cultures demand a formal management style based on expertise and procedures. They suit coordinators who are motivated by stability and control.
- Market cultures demand a goal-oriented management style based on setting targets. They suit achievers who are motivated by autonomy and personal accountability.

Clearly not everyone within an organisation will conform to these ideal types so you will need to adapt what you do to suit particular people. Bear these ideas about motivation in mind as you do your job. Think about how you can apply them as you relate to people and try to influence them. Don't treat these ideas as rules. There is no simplistic way of motivating people but these suggestions may help you to analyse how well you are dealing with this issue.
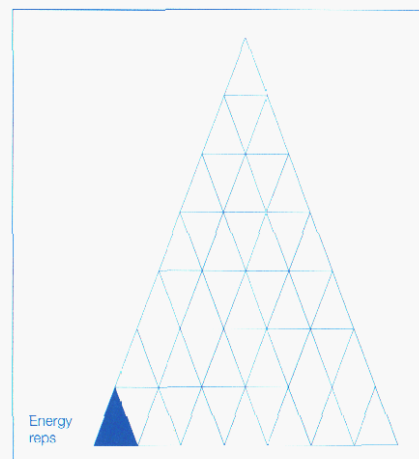
Energy representatives
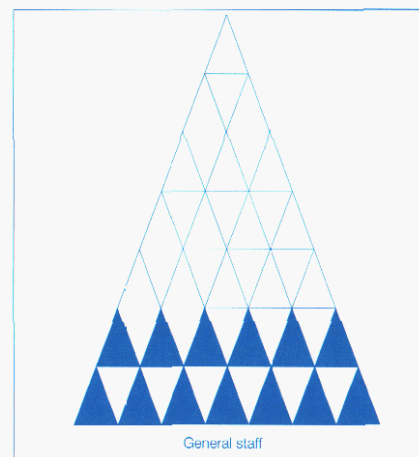
General staff

Staff need to be made more aware of:
- why and how is energy consumed in your organisation
- why energy saving is important
- how does their everyday behaviour affect energy consumption
- what effect will saving energy have on them.

INFORMATION SYSTEMS

Good information is indispensible for effective energy management. But conventional financial accounts do not make visible the benefits of energy management. Most organisations examine the aggregate expenditure and revenue related to each part of the business – they are interested in the 'bottom line' or how much of a profit or loss each department is making. This is a key reason why energy managers have had difficulty in the past in maintaining senior management interest and commitment.

Designing a good information system involves considering the whole process of adequate data input, sensible analysis and appropriate reporting. Until recently, energy information systems have predominately been discussed in terms of the hardware and software specifications for monitoring and targeting systems. Now much more concern is given to finding out what information end-users of such systems need and to designing interfaces that are user-friendly. Although they may form its core, monitoring and targeting are only part of a comprehensive energy information system.

Information is data that has been processed so that it is meaningful to users and helps them make decisions. When designing information systems, the object is to reduce the amount of data that decision makers receive while increasing the quality of relevant information at their disposal. Instead of producing streams of data, a system should monitor, analyse and produce output tailored for different types of decision.

The questions to ask when you review your existing information system are:
- who has an interest in the information it produces?
- what are they interested in knowing?
- are they getting the right information in the form that is most useful?

It is now widely accepted that information needs to be 'accurate, timely and relevant'. But of these three requirements, the most important is relevance; information has to be appropriate to the decision to be made. There are three levels of decision making in organisations which demand different types of information:
- operational control
- managerial control
- strategic planning.

Information	Operational control	Managerial control	Strategic planning
Source	internal	internal	external
Precision	high	medium	low
Timing	exceptional	periodic	irregular
Notice	sudden	anticipated	none
Nature	warning	results	predictive

Information needs vary

Accuracy and timeliness are also important, but they vary with the type of decision. You should always strive for accuracy in the data you gather and the information that you provide, but the degree of precision required varies. Do not confuse accuracy and precision. Precision is the variation you are prepared to tolerate in a measurement. For example, greater precision is needed to control a boiler system than to make a strategic decision about which fuel to burn. So for operational control you might measure consumption to the nearest kilowatt, while for strategic decision making you might only need consumption figures to the nearest £1000. But both sets of figures would need to be accurate within these acceptable tolerance limits.

Timeliness will also vary with the type of decision making. Effective operational control demands instant alarms when something goes wrong. But if the system is functioning correctly, you do not need to receive any information. Managerial control requires regular reports which correspond with your monthly budgetary cycle.

The information you need varies. For operational control you need precise information to give you warning of when something exceptional happens. For managerial control you need periodic reports on performance. For strategic planning you need predictive information quickly.

Strategic planning needs two kinds of information. The first is straightforward annual summary information that corresponds with a yearly review. The second is information that is needed irregularly, but often urgently, to support a line of speculative enquiry. With rare exceptions, information systems have failed to provide information to assist this kind of strategic decision making. This failure is to do with the nature of strategic decision-making which needs relatively coarse information across an unpredictably wide range of sources. Most databases do not include sufficiently wide ranging information on all the factors that strategic decision making might need to take into account, nor can they gather and analyse the necessary data quickly enough to be of any real use.

Barriers

The main barriers to the use of energy management information are:

Managerial

- energy management is marginalised as a technical speciality
- line management is inadequate
- there is insufficient interest and driving force from above
- there is little incentive for departmental managers and general staff to save energy

Technical

- getting accurate data on time is a key problem
- monitoring and targeting is not integrated with financial accounting
- output is not reported to either users or senior managers in a form they can readily understand and use.

Getting the most out of your system

The key things you need to keep in mind when developing an effective energy management information system are:

- decide who will use the information and involve them in making a realistic assessment of their needs
- keep data input and analysis as simple as possible compatible with achieving your aims
- ensure that the output motivates people to use energy efficiently
- justify the expense of running the system to senior management.

Who uses the information?

The six main groups of people that use energy information are detailed in Chapter 6:

1 top and senior management
2 departmental managers (or budget holders)
3 key personnel
4 energy management staff
5 energy representatives
6 general staff.

1 What information do senior managers need?

Senior and top management needs to know how much money has been saved by energy management to answer the questions:

- without energy management, how much more would the organisation have spent on energy last year?
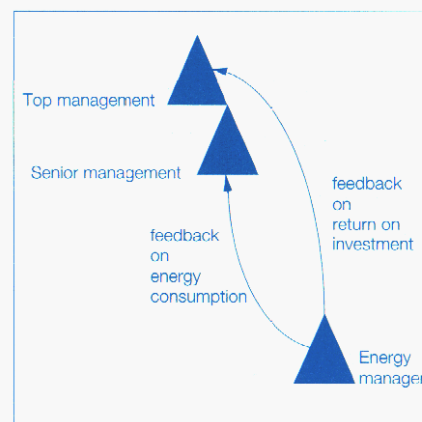
Feedback requirements of senior managers

● what total amount should be invested in energy efficiency with a short payback in the coming year?
● what major energy efficiency projects with longer payback should be funded and why?

You should be in a position to answer these questions in the annual energy management report to the chief executive and the board.

2 What information do departmental managers need?

Departmental managers, especially those who are budget holders, need to know how well key personnel are managing energy consumption in order to be able to answer the following question:

● is the department meeting its target and/or staying within budget?

This needs to be in as simple a form as possible, preferably in the same format as any other regular monitoring information they receive.

3 What information do key personnel need?

Key personnel are those responsible for controlling plant and premises. They need feedback on their performance in order to be able to answer the following questions:

● how much has energy consumption, after taking into account differences in the weather and occupancy, changed compared with last year?
● what has been the effect, in terms of energy consumed, of any energy management action taken?
● are these actions still working?
● is anything going wrong?

Your main task, as energy manager, is to train key personnel to understand how the information system works and to interpret the information it produces. One way is to involve them in the process of installing the system and designing the output.

4 What information do energy staff need?

In addition to the information above, you will also need information to help you answer:

● what measures would bring about increased energy efficiency in your buildings?
● what is the anticipated payback on these measures?
● what technical advances in energy management are on the horizon?

To answer these questions you will need to keep in touch through regional energy meetings, conferences, professional journals, engineering colleagues in your own organisation and other energy staff outside.

5 What information do energy representatives need?

Energy representatives need similar but more frequent feedback than ordinary staff to answer the following questions:

● by how much is their department or section improving?
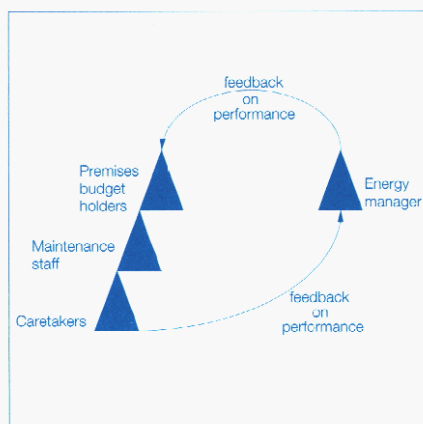● how much effect has their good housekeeping had?

Energy representatives, mainly volunteers doing a routine thankless task, also need regular praise and encouragement from energy management staff.

6 What information do general staff need?

General staff need simple feedback on how well their department or section is doing in order to answer the question:

● is its consumption of energy improving or getting worse?

At the very least, this might be in the form of a quarterly or bi-annual bulletin on a notice-board, in the company newsletter or pinned up in the entrance lobby.

Data input

How do you get accurate monthly consumption data for the premises or parts of buildings occupied by individual budget holders?

In a few cases, where the supply meter provides sufficiently disaggregated data, monthly invoices from the energy supply companies will be all that is necessary to run an effective monitoring and targeting system. But if some bills are estimated, or if readings are for periods that do not match your accounting periods, or if the supply

Feedback to and from key personnel

meter doesn't correspond with the areas you want to monitor, then you will need to install and read sub-meters.

Even for highly efficient organisations, getting accurate meter readings in time can be a headache. There are three alternatives:

- automate (in the long run automation is likely to be the best solution, combined with invoice data supplied in machine readable form by the supply companies)
- employ specific staff to collect meter readings
- get energy representatives in each unit or building to read the meters.

Do you need floor area or any other data about the premises you occupy? Ideally you need this information to measure the efficiency of your buildings and to assess priorities for up-grading your stock.

Reliable up-to-date information about premises, for example heated floor areas, fabric U-values and ventilation rates, is notoriously difficult to obtain in many organisations. But without it you will be unable to compare the performance of different buildings.

Data analysis

The CUSUM method, if applied to accurate monthly consumption data and degree day information, will provide information to help ask the questions you need to answer. This technique:

- establishes your current pattern of energy consumption and when it began
- identifies periods in which the pattern changes
- quantifies savings achieved from energy efficiency measures.
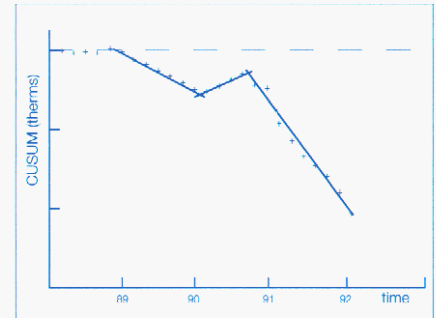
Output reporting

Control charts, showing the difference between actual and predicted energy consumption based on this pattern determined by the CUSUM method, can then be plotted. The system then flags a problem if consumption rises above a predetermined acceptable level.

Targets (for example, aiming to reduce the amount of energy consumed during the coming period by a given percentage) should be set in consultation with the those managing and working in particular areas rather than being imposed from above.

Forecasts of energy consumption are calculated using the 20 year average and by applying an estimate of fuel cost, a budget forecast can be calculated against which expenditure can be monitored.

Accounting procedures

It is essential to get energy management information into mainstream financial accounting, thus raising the profile of energy management and identifying savings from energy measures. If this information is not clearly integrated into the organisation's financial management system, this lack of awareness is a major barrier to the implementation of successful energy management policies.

The finance department won't keep the kind of energy accounts you need, but maybe they can be persuaded. In particular, they won't disaggregate savings or increased profitability so that the contribution from energy management can be identified. Nor will revenue savings made from capital investment in previous years be recorded. If no one else will do it, you will have to keep your own accounts. But make sure that they are compatible with those kept by the finance department.

One method, devised by Cheriton Technology, is a capital returns budget. This compares capital expenditure against reductions in revenue expenditure over time. Its essential feature is that it makes visible the fact that capital expenditure in one year generates savings in subsequent years. This form of accounting then provides strong evidence for further funding.

Investments in energy efficiency continue to yield benefits long after the initial investment cost has been recovered. To demonstrate savings you must devise a means of measuring the reduction in outgoings.


CUSUM graph showing changes in pattern of energy consumption over time

P. Harris, *Energy Monitoring and Targeting using CUSUM*, Cheriton Technology Publications, 1989.

P. Harris, *Applications Manual for an Energy Management Accounting Scheme Applied to Energy in Buildings*, Cheriton Technology Publications, 1991.

8 MARKETING

Although the main function of energy management is to control energy consumption and provide information to support decision making, as energy manager, you have an additional responsibility to promote energy management and market your activities. Promoting energy management involves the following key objectives:

1 raising awareness of the importance of energy efficiency to cost control and environmental conservation

2 marketing your services within the organisation

3 proving value for money to senior management

4 publicising your achievements in energy management outside the organisation.
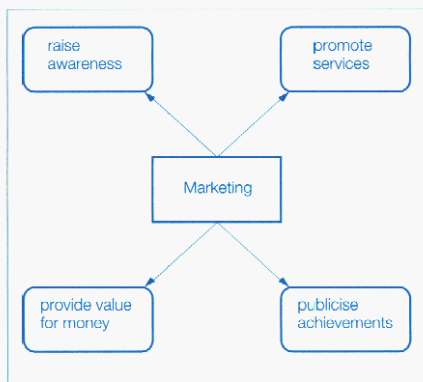
Why marketing?

As energy manager, you are involved in selling energy management as an activity at a variety of different levels:

● senior management
● budget holders
● premises managers
● general staff

You need to engage the attention of each of these groups and motivate them to follow your advice and adopt better practice. In particular you have to promote respect for energy management and increase its take-up.

Marketing means treating the people who use your services as 'customers'. Marketing is about needs and benefits – it's what other people want that is important, not what you want. Some of the things you do as an energy manager – monitoring and targeting, energy surveys – are not of first importance. Finding out what people want is.

It helps to distinguish between features and benefits. The latest M&T software may produce CUSUM plots, but the benefits are quantifying savings and identifying faults. What the users of your services consider value for money is not just the service but more importantly what it does for them.

All relationships with users of your services have a marketing element – they represent a chance to promote energy management. For example, reports to senior managers should attempt to demonstrate how you give value for money. And the effect on staff motivation and energy awareness should always be considered when preparing budget tracking statements for departmental managers.

Successful marketing involves discovering all you can about the end users of your services. After all, they are the people that keep you in a job. This means trying to answer a number of key questions:

● What do you provide end users with now? For example, a chart showing monthly energy use plotted against consumption the previous year.

Marketing objectives
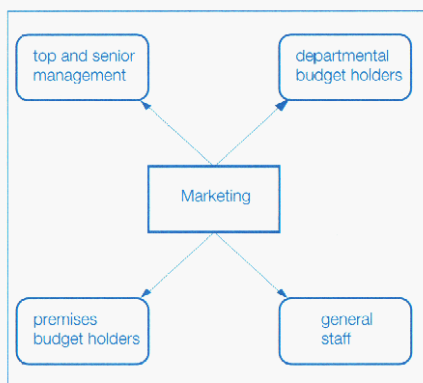
Target audiences

- What use have they made of it? Perhaps they file it away and forget about it.
- Is this what they really want? Maybe what they need is a way of tracking energy spend against a realistic budget to know whether they are under or over spending, or a system that gives a warning that energy is being used inefficiently and identifies the likely fault.

Selling

You may have a horror of selling. You may even believe that selling has nothing to do with energy management. But to be effective you must sell yourself and energy management.

Few energy managers will have formal training in selling, but it is a skill that you can learn and apply as readily as your technical expertise. Selling, more than anything, is about sincerity and a belief that what you are offering satisfies customers and gives them value.

The first step: you are out to identify 'customers' of your services and key personnel who can affect energy consumption. These are the people, the key individuals, you need to get to know. While you are selling, the technicalities of energy management come second; first it is important to gain people's confidence in your ability.

Internal relations

Public relations is something most of us do without thinking – that is we try to present a favourable image to the world. Internal PR means keeping the work-force informed and involved. It implies good communications between management and staff. A regular period for discussion, for example with groups of energy representatives , budget holders or members of an energy committee, can be used to maintain this communication.

To make progress it is up to you to encourage a debate on problems and possible solutions. Everyone has something to contribute. Go round the group, which should not be more than a dozen people, and encourage each person to speak. There is nearly always a better way of doing things and often those performing the actual task are the best people to ask. Encourage suggestions and make everyone feel that they have an important part to play.

Visit people in their own office or where they work. Get them to show you what they do. But don't just do the rounds like the milkman; you can't afford to waste your time. Every hour you spend away from your base must be exploited to the maximum.

You must develop a system. You need to record people's names, job titles, phone numbers, names of secretaries or assistants, and the date when you last saw them. As well as this basic information you also need to note what it is that they particularly want from you and any personal details. Unless you adopt a routine approach to marketing, you will dissipate your efforts.

External public relations

External PR is largely to do with using the media to publicise the organisation's energy activities. This need only be a short item in a trade journal or local newspaper. It need not cost much – just time and a nose for what might be newsworthy. You could employ a professional firm of consultants, but since you are the one who knows what you are doing, perhaps you are the best person to do it. Maybe your organisation already employs a press officer who can help. Having found an outlet that will take material, try and use it regularly.

Energy conservation is of increasing interest and concern and people will want to know what you are achieving, especially if you can give your story a 'human interest' or an 'environmental' slant. Sponsorship, links with schools and donations to charities are some of the ways used to improve the news value of a story. For example an energy manager in a local authority might involve secondary school children in running a monitoring and targeting system in a local school. Or a department making savings in a private company might be allowed to donate a proportion of these savings to a local charity. These types of activity have direct benefits in motivating users, but they also have a PR spin-off that you can use to have a wider impact.
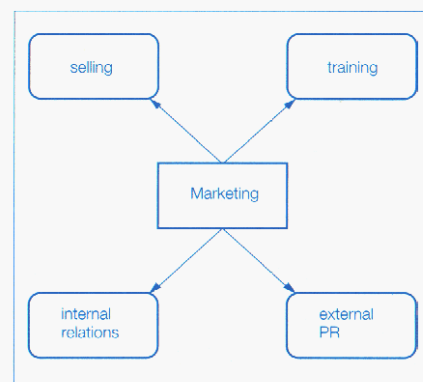
Marketing activities

Training materials

Targeted marketing material
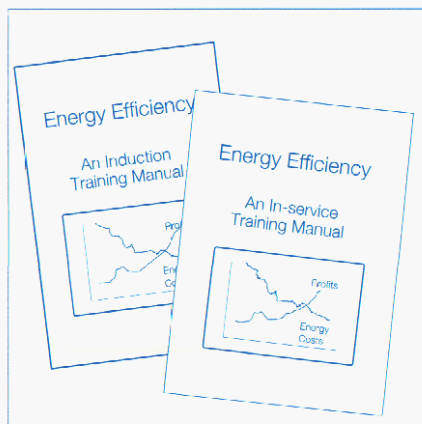
Training

The purpose of training staff in energy management is not principally to teach them technical issues, like how to read meters or interpret reports, but is much more to do with motivation. What you are trying to do is raise the profile of energy management and convince them that it is a worthwhile activity.

You will need to devise different training sessions for different people, not just one standard twenty minute presentation. Tailor each presentation to fit specific needs and level of understanding. Devote particular attention to devising workshop sessions for key personnel who have an impact on energy consumption. These should have the express aim of improving the energy information these people receive and how they act on it.

Energy forums, training days, seminars and talks all offer opportunities to promote energy awareness and to market your services. Energy managers can make presentations to all kinds of gatherings, for example: board meetings, management team meetings, seminars for budget holders and premises managers.

Market research

Market research means finding out as much as you can about:

- who the people are who use, or might use, your services?
- what their needs are?
- what other energy managers do?
- what appropriate energy saving measures are available and how much they cost?

You need to be constantly looking for chances – chances to introduce energy efficiency measures but also opportunities to influence people. As energy manager, you have to be well-versed in all aspects of your organisation since most of these opportunities lie outside your own department. Energy management operates across departmental boundaries. So you need to understand the structure of your organisation, who you must influence and how to go about it.

This means that you need to get to know not only the formal structure, in terms of who reports to whom and how different departments relate to each other, but also the informal structure. This can only come from experience. If you are new to the job or have just joined the organisation, you will need to devote a great deal of your time and energy at first to getting to know people and finding your way around. It will help enormously if you have the backing of top management.

You need to distinguish different audiences for your marketing activity. This means that you should develop a range of promotional material targeted at specific levels in the organisation. You don't ask chief executives to turn lights off. You ask them to endorse and back policy action. The methods you can use to research the market are principally:

- talking to people within your own organisation
- meeting other energy managers
- reading the energy trade literature and journals.
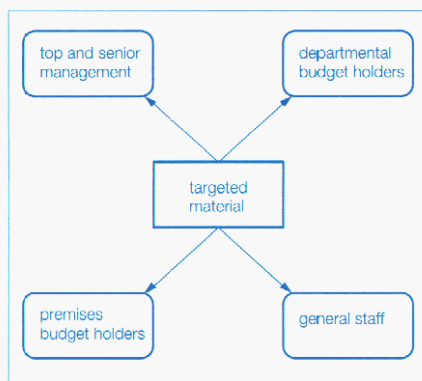
How much should you spend on marketing?

The amount you budget for marketing is not an easy matter to decide. But it is probably much more than you spend at the moment. Promotion needs to be recognised as being not only valid but essential. This means it should be programmed into your time and adequately resourced. Marketing has to be explicit – recognised, recorded, costed and funded. So:

- work out what is required
- what resources are needed
- how to supply it
- how to fund it.

Some energy staff find themselves in a double bind. On the one hand they are exhorted to go out and sell their services, but since they can't charge this work to a client or particular budget, they feel guilty about spending the time. There may be

particular problems in the public sector where marketing activity will have to come from severely constrained revenue budgets.

Two rules of thumb for how much time and money you should devote to marketing are:

● perhaps as much as a fifth of your time; certainly not less than a tenth
● initially about 10% of your budget, settling back to 5% after the first year or two.

Don't forget that out of this marketing budget must come all costs of research, advertising, public relations, promotion and possibly training.

Marketing takes time and is difficult to account for. So you need to keep a record in your diary of how the time is spent, who you see, what you do, what you think you might have achieved. Without a systematic approach you will lose track and find it difficult to get the support of your line manager.

The biggest problem you face is knowing what benefits you will get from spending on marketing. It would be easier if you were selling a product. Selling a service within your own organisation is more difficult to justify. Services are invisible, so personal reputation and track record are everything. Services are bought to satisfy a need, so you must identify the real needs of your 'customers' and convince them that you are able to satisfy these needs.
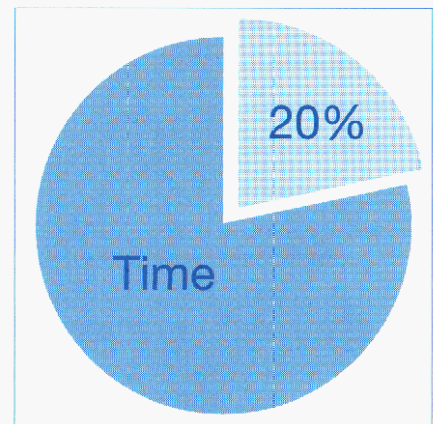
Proportion of time spent on marketing

Planning your marketing

Planning your marketing strategy is about trying to see where you are going and planning some mile-posts along the way. The plan should be realistic and attainable. It need not be a lengthy document, probably only one side of A4, and should be in two parts – analysis and strategy.

Analysis
1 Who are your existing customers?
2 What services do you provide them with at the moment?
3 Can these services be extended?
4 Are there any other potential 'customers'?
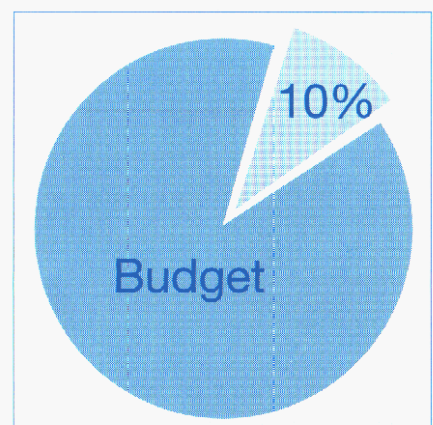5 How are the costs of your services to be charged?

Strategy
1 What are your objectives in quantitative terms?
2 How are you going to achieve these objectives in terms of personal contacts, publicity, talks?
3 What are the dates of these initiatives? (Put them in your diary)
4 What is the cost of these in terms of time and money?
5 How are you going to fund this activity and justify it to your superiors?

Proportion of budget spent on marketing

How can you keep up the momentum?

Once you start getting results, you will want to keep the momentum going. The point is that you are keeping energy management in the public eye, not letting yourself get hived off in a technical backwater, vulnerable to being axed if the establishment is slimmed. By raising the profile of your activities you are ensuring that energy management has a long-term future.

But don't assume that you can do it all yourself. You can enlist help from elsewhere in the organisation or even buy in help from outside, as and when needed.

9

INVESTMENT

There are two aspects organisations have to give attention to when considering whether to increase their investment in energy efficiency:

- *internal* – its effect on their in-house operations
- *external* – its impact on relationships with clients and local communities.

To persuade your organisation to commit itself to a programme of investment in energy efficiency, you need to able to demonstrate:

- the size of the energy problem it currently faces
- the technical and good housekeeping measures open to it to reduce waste
- the predicted return on any investment
- the real returns achieved on particular measures over time.

The existing situation

Any investment has to be seen as an addition to, not as a substitute for, having effective management practices for controlling energy consumption throughout your organisation. Spending money on technical improvements during Phase 2 of your programme of energy management cannot compensate for inadequate attention to gaining control over energy consumption during Phase 1. So, before you make any investments, it is important to ensure that:

- you are getting the best performance from existing buildings, plant and equipment
- your fuel charges are set at the lowest possible tariffs
- you are burning the correct fuels as efficiently as possible
- good housekeeping practices are being regularly employed, at least by key personnel.

The timing of technical improvements can also be critical to their financial viability and acceptance. The good time to invest in technical measures is when you are adding a new building to your stock or when essential refurbishment work is being undertaken on existing premises. At such times, the marginal cost of increasing energy efficiency can be very low.

In managerial terms, you need to ensure that there are ways that you and your staff can have an input to any new design work and major maintenance so that opportunities for increased energy efficiency are not lost. Even with routine maintenance, take action to ensure that like is not replaced with like whenever energy efficient, cost-effective alternatives are available.

Identifying opportunities

The commonest approach to deciding when and where to invest in energy efficiency has been to tackle those premises with the largest energy expenditure first. This has

Energy Efficiency

A Report on

Investment Opportunities

Reporting investment opportunities

an obvious advantage. Proportionately larger savings can be made from big bills than from smaller ones. This can be a good tactic if your immediate need is to show that energy management activities provide value for money. But, unless you have a mechanism for retaining part of the large savings you make, this approach can be self-limiting. [See Chapter 10: Funding]

A more sophisticated and systematic approach to investment opportunities is required if it is to be robust and enduring. Once you know the energy consumption for each of your premises, you can set up a simple matrix to use as a rough guide for identifying the right order in which to introduce technical improvements to your buildings.

Setting priorities

When listing investment opportunities the following factors need to be considered:

- a building's energy consumption/unit area
- the current state of repair and energy efficiency of its fabric, plant and services, including controls
- its delivered environmental conditions - not just room temperatures but indoor air quality and air change rates, draughts, under and overheating, condensation, mould growth, adequacy of natural and artificial lighting including glare, etc
- the residual life or length of tenancy of the building
- the effect of any proposed measure on staff attitudes and behaviour.

Give attention to each of these factors when you are weighing up investment opportunities. If you neglect any of them, you may still make energy savings in the short term but this may jeopardize the reputation and longer term viability of energy management within your organisation.

For instance, if you simply give priority to funding technical measures in buildings with the largest energy bills, without due regard to trying to improve the worst environmental conditions delivered elsewhere within your stock, then you may lose the support and sympathy of those who have to endure them. Similarly, if you invest predominantly in measures which save money but not energy, e.g. tariff changes or fuel substitution, then you run the risk of estranging people who are concerned about environmental issues. Bear in mind that, in the longer run, investments which alienate members of staff may cost you and your organisation more – in reduced productivity, in lost good housekeeping practices, misused controls or abused maintenance – than you can expect to save from the measures concerned.

Proving value for money

One of the most intractable problems which many energy managers face is justifying why their organisation should invest money in increasing its energy efficiency, especially when there are other, seemingly more important calls on its capital. This problem often operates as a double bind:

- organisations typically give priority to investing in what they see as their core or profit-making activities in preference to energy efficiency
- even when they do invest in saving energy, they tend to demand faster rates of return than they require from other kinds of investment.

Building a case for investment

As energy manager, you need to identify how cost savings arising from energy management could be redeployed within your own organisation to maximum effect. To do this, work out whether, in your own case, the benefits of increased energy efficiency are best sold as:

- reducing operating/production costs
- increasing employee comfort and well-being
- improving cost-effectiveness and/or profits
- protecting under-funded core activities
- enhancing the quality of service or customer care delivered
- protecting the environment.

Energy Efficiency

Investment Priorities

A. Priorities for 1993
B. Priorities for 1994
C. Priorities for 1995
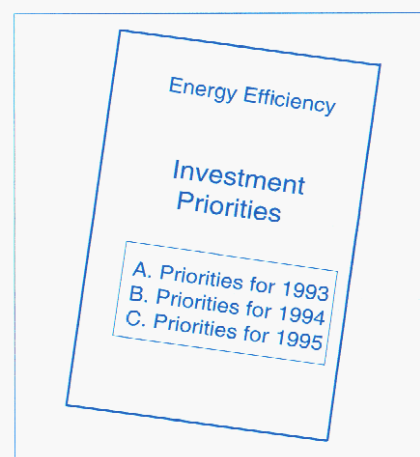
Reporting investment priorities
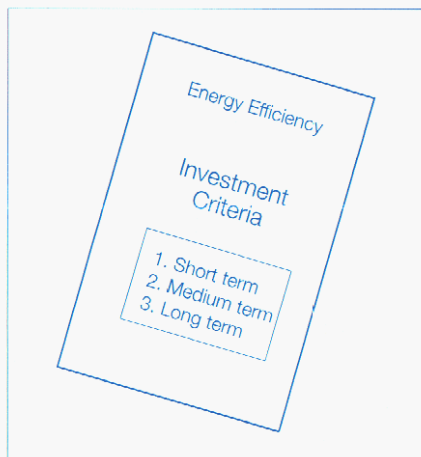
Reporting investment criteria

D. Somervell & R. Talbot, *Educated Energy Management*, University of Edinburgh, E & FN Spon, London, 1991.

R. Baldwin & G. Atkinson, *Investing in energy efficiency: appraisal techniques and assumptions,* Information Paper 20/86, BRE, 1986.
CIBSE, *Contract Energy Management,* Applications Manual AM6:1991, CIBSE.
R. Dixon, *Investment appraisal: a guide for managers,* Chartered Institute of Management Accountants, Kogan Paul, London, 1988.
J. Pezzey, *An Economic Assessment of Some Energy Conservation Measures in Housing and Other Buildings*, 1984.

Energy Paper 50 *Energy Conservation Investment in Industry: an appraisal of the opportunities and barriers*, [The Armitage Norton Report], HMSO, London, 1983.

Specific examples of such benefits can be used as the basis of the case which you put forward each year, ideally through your inter-departmental energy management committee to your full board or committee, for maintained or increased investment.

For example, Sainsbury's top management gave their backing to increased investment in energy efficient technology and store design once they understood that this not only gave them a market edge over their competitors but also fed directly into increased company profits. Once this connection was made, energy was transformed from a marginal consideration, representing an insignificant proportion of annual turnover, into a real investment opportunity which has consistently and significantly boosted company profitability.

The Sainsbury example should not be seen as surprising, nor is it likely to be an isolated case. For, after staffing and premises, energy is often an organisation's largest variable (as opposed to fixed) cost. Because of this, energy savings feed directly into the bottom line. This can be particularly important in public sector organisations which are usually heavily cash-constrained since energy may be the only variable cost which can be reduced without adversely affecting the quality of service provided. In this way, cash-starved core activities can receive much needed injections from savings made on energy expenditure.

In a large university, for example, with an energy bill of around £2m, a 5% reduction in energy expenditure could pay for 5 extra teaching staff or add 15% to its library's book or journal grant. Whichever economic sector you work in, once you know what your annual energy costs and savings are in relation to other similar enterprises, then you can calculate what can be achieved in your own organisation.

Investment appraisal

As Somervell and Talbot make plain in *Educated Energy Management*, any organisation is likely to have more viable opportunities for investment than it has money to spend. So it has to decide where and how to invest its money to its best advantage.

There is no shortage of material explaining how to apply investment appraisal criteria to energy efficiency measures in buildings. These sources explain the factors which need to be taken into account in any appraisal exercise and spell out the differences between the types of criteria which can be applied to such investments, ranging from simple 'payback' calculations right through to 'life-cycle' costing. The objectives of investment appraisal are:

- to determine which investments make the best use of available money
- to ensure optimum benefits from any investment made
- to minimise the risk from making investments
- to provide a basis for subsequent analysis of the performance of the investment.

Investing in reducing energy consumption is traditionally given a low priority in the financial management of organisations. The Armitage Norton Report showed that this arises because many organisations define such investment as discretionary business maintenance expenditure which is given low priority. This problem is compounded because improving energy efficiency calls for an investment of capital in order to make a future saving in revenue expenditure. So capital expenditure in one year becomes divorced from revenue gains in another. In addition, in most organisations, accounting systems focus on records of income and expenditure and the benefits from investing in energy efficiency are simply not visible. Financial records only show outgoings on fuel and energy efficiency measures. They do not measure cost savings from reduced expenditure on energy or other attendant benefits arising from such investment. In these circumstances, you need to take two steps to protect your reputation:

- take particular care to prepare a detailed investment appraisal for any measure which you wish to see funded which clearly demonstrates cash savings in subsequent years
- keep your own accurate records of all costs and benefits arising from energy efficiency measures since no one else is likely to compile information to support your activities. [See Chapter 7: Information systems.]

Investment criteria

In most respects, investment in energy efficiency is no different from any other area of financial management. So when your organisation first decides to invest in increasing its energy efficiency it should apply exactly the same criteria to reducing its energy consumption as it applies to all its other investments. It should not require a faster or slower rate of return on investment in energy efficiency than it demands elsewhere.

Initially, when you can identify no or low cost investment opportunities, this principle should not be difficult to maintain. However, if your organisation decides to fund a rolling programme of such investments, then over time it will become increasingly difficult for you to identify opportunities which conform to the principle. Before you reach this position, you need to renegotiate the basis on which investment decisions are made.

It may require particular thoroughness to ensure that all the costs and benefits arising are taken into account. The use of simple payback periods may not be sufficient and more rigorous appraisal techniques such as Discounted Cash Flow, Internal Rate of Return and Net Present Value may be more appropriate. If you do not possess sufficient financial expertise to calculate these yourself, you will need to ensure that you have access, either within your own staff or elsewhere within the organisation, to people who can employ them on your behalf.

There are two quite separate grounds for arguing that, at least towards the end of Phase 2 of your programme of energy management, your organisation could begin to apply a slower rate of return to its investments in energy efficiency than it applies elsewhere.

- The benefits arising from some energy saving measures can continue long after their payback periods. Such measures do not need to be written off using fast discounting rates but can be regarded as adding to the long term value of the property. For this reason, short term payback can be an inadequate yardstick for assessing longer term benefits. To assess the real gains from investing in saving energy, you should use investment appraisal techniques which accurately reflect the longevity of the returns on particular types of technical measures.
- There is currently a significant propaganda premium to be earned by any organisation which demonstrates that it is committed to improving its environmental performance. By invoking external pressures on your organisation, whether in the form of public opinion or governmental policy on green issues, you may be able to justify positive discrimination for investment in energy efficiency, for example by reference to reducing cfc or CO_2 emissions or to combating sick building syndrome.

Protecting energy investment

It is essential to keep a careful watch on your organisation's maintenance policy and practices in order to protect any investment already made in reducing your organisation's energy consumption. There is a clear dependence relationship between energy efficiency and maintenance. This operates at two levels:

- initially, improving energy efficiency is most cost-effectively done in existing premises on the back of maintenance work
- subsequently, unless maintenance is regularly undertaken, savings from installed technical measures, whether in new-build or existing premises, may not be realised.

If underspending on maintenance or other imbalanced priorities threaten that investment, then it is your responsibility to signal this to the appropriate senior managers and spell out the short and longer term consequences for energy consumption. Always try to keep a clear distinction between the maintenance and energy management functions within your organisation but illustrate the clear relationship between these two interdependent areas of activity.
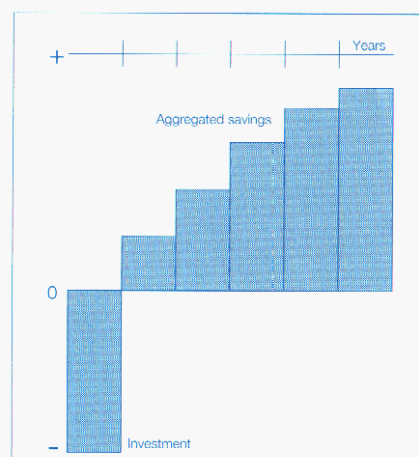
Benefits from energy saving measures

Oxfordshire County Council, as part of their investment programme of in energy conservation and innovation, have relaxed the six-year payback rule on 30% of the energy conservation budget. This means that they can invest in 'green conservation schemes' which have an environmental protection rather than a cost benefit.

10 *FUNDING*
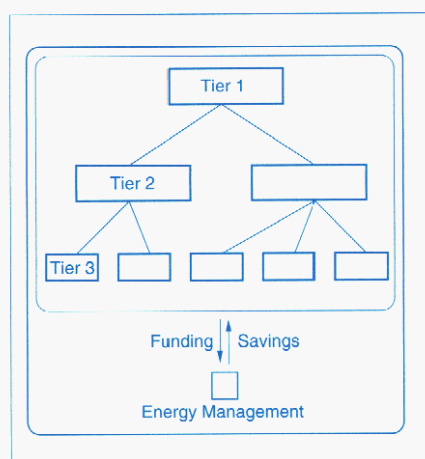
Funding and savings as a two-way flow

Energy management is rarely established in a way that is financially sustainable. Its financial basis is often short term or insecure. Extinction, if not actually imminent, is at least a recurrent possibility.

The funding of energy management is usually discussed simply in terms of the number of staff or the money available for technical measures to save energy. But, in the first instance, it is important to consider the whole issue of how to finance energy management at a more basic level than this and ask two fundamental questions which are too frequently ignored or glossed over:

● where, over both the short and long term, are the funds to support energy management to come from?
● where, in both the short and long run, will the savings go?

Unless these simple questions can be successfully answered, then however sophisticated your energy management activities become, they are likely to remain financially unstable. Either they will run the risk of operating on a financial basis that, sooner or later, becomes self-limiting, or if they survive, it will be in circumstances where their continued existence is always vulnerable to changes in priorities which are decided elsewhere within your organisation.

Key decisions

There are two essential decisions which your organisation needs to make about its involvement in energy management:

● is it to be conducted by in-house staff or bought in from outside?
● is it intended to be a time-limited project or a permanent function?

The answers to these questions may vary over time. For example, an organisation might start with energy management being staffed solely in-house and then, in the longer term, move to employing an external energy management contractor to carry out specific tasks. Or, like Sainsburys, it may begin by employing external consultants (for example, to set up and commission its M&T system) and then use in-house staff to run and maintain it.

Where energy management is bought in from external consultants or energy management contractors, then it can be paid for, as and when required, like any other service – whether on a fee basis or through allocating a percentage of the savings made.

Because of its continuous and phased nature, it is not sensible to treat energy management as a time-limited project. It can only really be effective as a permanent function. However, there are specific energy management activities, such as the introduction of an information system or the provision of training programmes, which can be successfully treated as projects.

You need to understand your own organisation's intentions here. For the choices it makes may be critical to the way in which energy management activities can be financed in your particular case. For example if your organisation intends to employ outside consultants for all its energy management, there may less need for it to be established on a secure, sustainable basis. However, if it is intended to establish energy management as a permanent in-house function, there can be clear advantages to making it self-financing and self-sustainable.

Funding options

There are four options for funding in-house energy management:

1. from a central budget
2. from a specific departmental or section budget, such as building services or engineering
3. through payment for services by individual budget holders, or
4. by retaining a proportion of the savings achieved.

All of these methods for financing energy management are workable, at least in the short term. Or an organisation could use a combination of options, for example, part central funding and part payment for services rendered. But routes 1 to 3 are likely to constrain, if not immediately, then certainly in the longer term, the type and level of energy management activities which can be undertaken. These are likely to be restricted to those which yield direct and attributable short term savings.

Use of savings

Whichever route to funding is chosen, the next key question remains the same - precisely what happens to revenue savings arising from energy management activities? Such savings can be fed in or out of an organisation at four different levels:

- paid out as a dividend to staff or shareholders
- absorbed into the central budget
- retained by department, section or premises budget holders, or
- returned to the energy management budget.

Unless the correct balance is struck in the distribution of revenue savings across these levels, the long term future of energy management will remain in doubt.

If all of the revenue savings arising from energy management activities are distributed as dividend or go to other budget holders, then energy management cannot become self-financing. Where this occurs, continued funding for energy management is insecure since it depends on either:

- the continued willingness of others to vote funds top sliced from their budgets, or
- your ability to continue to win service contracts from budget holders.

Both of these may be difficult to achieve, especially if budgets are tight. But it is not just the continuity of funding that is at risk if funding is insecure. The range of energy management activities which can be undertaken is also likely to be limited to those which accord with criteria decided elsewhere in the organisation, typically by the budget holders in question. For example, you may find it difficult, even impossible, to finance medium to long term activities such as:

- awareness raising and energy-related training
- motivation and promotional campaigns
- technical measures which, while cost-effective, do not provide short term savings.

Self-financing energy management

One way to make energy management self-financing is to split revenue savings to provide identifiable returns to each interested party. This has the following benefits.

- Assigning a proportion of energy savings to your energy management budget means you have a direct financial incentive to identify and quantify savings arising from your own activities.
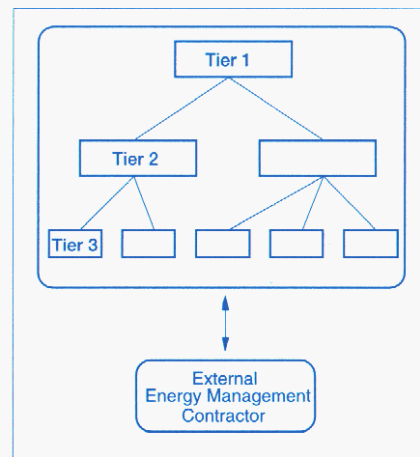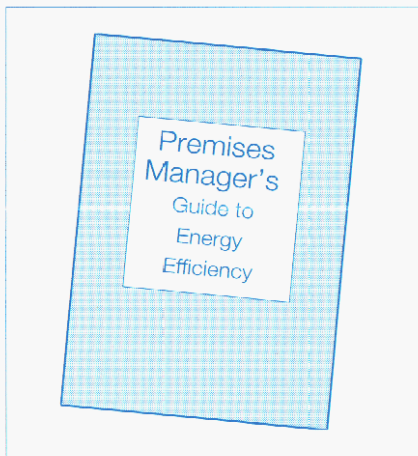

External energy management contracts
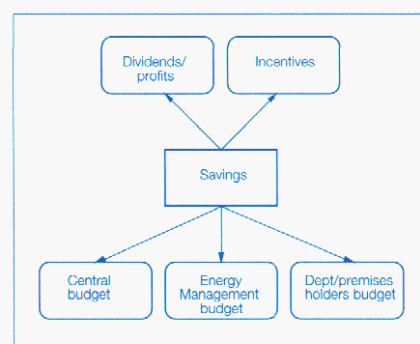
Possible distribution of savings from energy management

Premises
Manager's
Guide to
Energy
Efficiency

A guide for premises managers

- Separately identified returns will help the constituent parts of your organisation understand whether they are each getting good value for money through their support for energy management.
- If operated successfully, splitting the savings will improve motivation and commitment to energy management throughout the organisation since staff at all levels will see a financial return for their effort or support.
- But the main benefit is on the independence and longevity of the energy management function which will become increasingly apparent as your programme of energy management moves into Phase 3.

Ensuring continuity

During Phase 1 and at the beginning of Phase 2, your organisation ought to be able to make considerable savings at little cost (except for the funding needed for energy management staff). The important question is what should happen to these savings?

If part of these easily achieved savings is not returned to your budget as energy manager, then your access to self-generated investment funds to support future activities will be lost. And later in the programme it is likely to be much harder for you to make savings.

As your organisation progresses through Phase 2, the investment opportunities available to it will have increasingly longer payback periods. And, by the time it reaches Phase 3, if none of the continuing revenue savings come back to you as energy manager, then the management information system required to maintain control and protect existing investment in energy efficiency will have to be funded from elsewhere. This will make the continuation of your energy management activities vulnerable to budget cuts when they are in competition with other activities having higher priority.

However, if, as energy manager, you have access to a proportion of the revenue savings arising from your staff's activities, then these can be re-invested in:

- further energy efficiency measures
- activities necessary to create the right climate for successful energy management which do not, of themselves, directly generate savings
- maintaining or up-grading the management information system.

For energy management to be self-sustaining, returns on revenue savings may need to continue to be paid beyond the payback period used as the criterion for making an investment decision.

Funding other activities

Some energy management activities are unlikely to produce attributable savings. Nor are they likely to be attractive to the short-termism of those who take out service contracts and who want immediate savings on their investment. This is true of work on raising energy awareness, training, and other motivational activities. It may also apply to internal reporting, maintaining and upgrading management information systems and marketing. While promotional activities may be essential to the continued survival of energy management, they are unlikely, of themselves, to save energy or money.

All of these types of activity are crucial, however, to creating the right climate of opinion in your organisation - one that is receptive to and supportive of attempts to control energy consumption, whether in terms of:

- adoption of 'good housekeeping' practices by all grades of staff
- acceptance of the need to manage energy by all types of managerial staff, or
- protection of money invested in technical measures to save energy against misuse, abuse or neglect.

One clear way to fund such activities is by allowing you, as energy manager, to retain a proportion of the income generated by, or the savings made from, other activities to be used specifically for this purpose.

Organisations vary in the proportion of energy management activities they treat as an overhead charge with no expectation of a direct payback. Depending on your circumstances, this may vary from 10% to 40%.

How much funding

Whatever your organisation sees as the primary purpose of energy management and however it chooses to fund such activities, the total sum allocated should not normally, during Phases 1 and 2 and most of Phase 3, be less than 10% of its annual energy expenditure. Clearly, at some points during these phases, it may need to be more than this. This will depend on:

- the level of investment required to:
  - improve the energy efficiency of your premises, plant and equipment
  - raise staff energy awareness
  - meet staff energy-related training needs
  - upgrade the energy information system
- the number and expertise of the staff needed to carry out these activities.
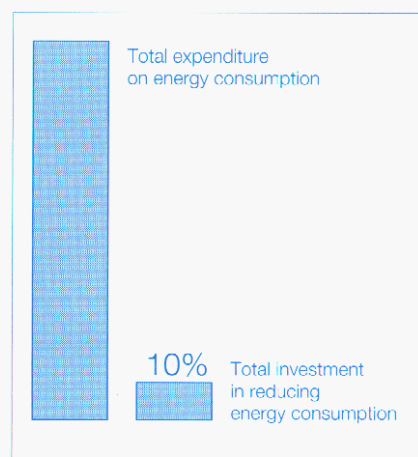
Investment in energy management activities as a proportion of total energy expenditure

Eventually, your organisation may reach a point in Phase 3 where it is unable to identify further worthwhile investments on any of these fronts. Then its funding for energy management may drop below 10%. But, even then, you need to ensure that funding is kept up to a level sufficient to protect existing investment in energy efficiency - whether in installed technical measures, training, good management practices, or simply to retain competent energy management staff.

Cash flow

Careful planning can minimise initial costs of energy investment and achieve identifiable cost savings. Many accounting conventions allow capital expenditure that reduces revenue costs to be properly charged to a revenue account, provided that there is no additional cost within the accounting period. This requires that:

1. nil cost measure are implemented without delay.
2. fast payback measures that are effective throughout the year should be implemented as early as possible in the accounting period.
3. fast payback measures that have a seasonal component due to weather or occupancy patterns should be implemented immediately before the period when savings can be made.

Careful planning and close control over projects will enable investment at a rate of 10% of total expenditure on energy to be achieved with only low levels of nett cash outflow in the first year of activity. Subsequent activity can be funded from accrued savings, though in practice a capital injection of 10% of annual energy expenditure is sought.
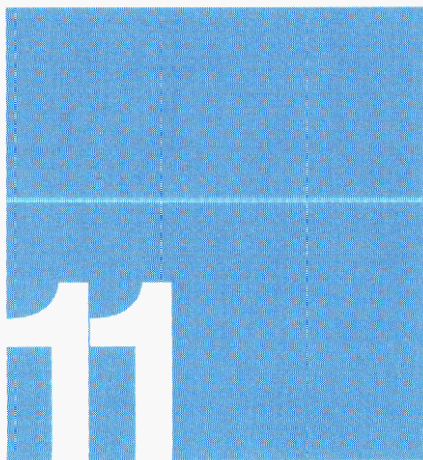
SAMPLE ENERGY POLICY

PART 1

Declaration of commitment

As part of our environmental strategy, this organisation is committed to responsible energy management and will practise energy efficiency throughout all our premises, plant and equipment, wherever it is cost-effective to do so.

Policy

The policy of this organisation is to control energy consumption in order:

- to avoid unnecessary expenditure
- to improve cost-effectiveness, productivity and working conditions
- to protect the environment, and
- to prolong the useful life of fossil fuels.

Objectives

Our long term objectives are:

1 to buy fuels at the most economic cost
2 to burn and use them as efficiently as is practicable
3 to reduce the amount of pollution, particularly CO_2 emissions, caused by our energy consumption, and
4 to reduce, wherever possible, our dependence on fossil fuels through the use of ambient and renewable energy.

Immediate aims

In the short term, our immediate aims are:

1 to gain control over our energy consumption by reviewing and improving our purchasing, operating, motivation and training practices
2 to invest in a rolling programme of energy saving measures which will maximise returns on investment in order to generate funds which can be re-invested, at least in part, in further energy management activities, and/or
3 to safeguard these gains by establishing and maintaining a management information system designed to ensure that information is delivered to those who need it, on time and in a form which supports their managerial decision-making. (*Delete whatever is inappropriate, according to the phase of energy management currently reached.*)

PART 2

Responsibilities

Responsibility for controlling the consumption of energy resides with the relevant end user nearest the point of use who is accountable to a budget holder for that consumption.

Responsibility for expenditure on energy resides with the budget holder nearest the point of use who is directly accountable to the finance director for such expenditure.

Responsibility for co-ordinating energy management activities resides with the energy manager who is accountable, through the head of the section in which he/she is located, to the Energy Management Committee.

Responsibility for formulating and implementing energy policy lies with the Energy Management Committee which is accountable to the main board.

The energy manager and his/her staff will be located in the section(s) most relevant and supportive to the phase of energy management activities currently being undertaken. This section is … *(Specify as appropriate)*.

The Energy Management Committee will be made up of representatives from each of the energy-consuming sections within the organisation. These representatives are … *(identify by name and post)*.

It will meet quarterly and be chaired by … *(Identify by name and post)*

a member of the main board.

This Committee will operate as a sub-committee of the Environmental Management Committee to which it will report *(Delete if inappropriate)*.

Structure

The energy manager will make a monthly report to his/her line manager on energy management activities, providing separate accounts of expenditure on:

- energy consumption, and
- energy management activities.

Through the line manager, he/she will make a quarterly report to the Energy Management Committee, which will report regularly, and make an annual presentation, to the main board on:

- energy consumption throughout our premises, plant and equipment
- energy management activities undertaken to reduce such consumption.

Lines of communication

Formal communication on matters relating to the control of energy consumption by end users or budget holders will be directed through the energy manager who will, where appropriate, bring it to the attention of his/her line manager, other senior managers, and to the Energy Management Committee.

Formal communication on matters relating to energy management activities will also be channelled through the energy manager who will, where appropriate, bring it to the attention of all relevant end users, budget holders, his or her line manager, other senior managers and to the Energy Management Committee.

Action plan

During the coming year, the following energy management activities will be undertaken:

- a costed programme of work
- a detailed timetable with specified milestones
- indicating actions to be undertaken by designated personnel.

Resources

The number of staff employed in energy management, their mix of skills and the amount of investment correspond with the demands of these activities.

In accordance with the Energy Efficiency Office's *Good Practice Guidance*, the number of staff for the coming year will be … *(Specify as appropriate.)*

In accordance with the Energy Efficiency Office's *Good Practice Guidance*, funding for the coming year will be 10% of our annual expenditure on energy, ie … *(Specify as appropriate.)*

Review

All energy management activities will be subject to periodic review. The energy manager will establish progress towards meeting objectives and the value for money of individual activities wherever possible. An annual audit of these activities will be prepared on behalf of the Energy Management Committee and presented to the main board. Subsequently, relevant extracts will be circulated to appropriate senior managers, budget holders and end users.

This policy document will be reviewed and updated annually.

Sample Policy

12
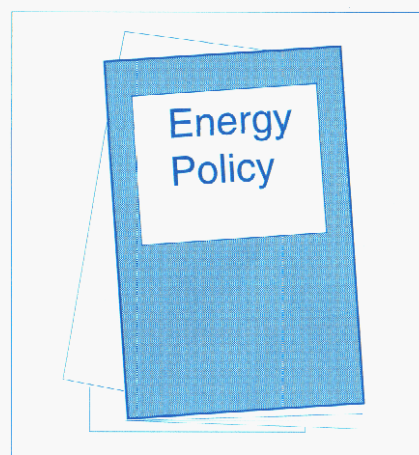
THE WAY FORWARD

It is important to appreciate that energy management is not a technical specialism - it simply requires good management practices. Improvement must come from both ends of your organisation – from the top down and the bottom up.

Top down – supportive leadership
Board level commitment is required if your organisation is to develop and successfully implement an effective energy management policy.

Bottom up – demonstrable performance
A great deal is expected of energy managers, yet energy management may well be under-resourced in your organisation. Concentrate your efforts where you can make most impact, and publicise your success to get the funding you need for energy management and investment in energy efficiency.

The Energy Manager's Golden Rule
Energy managers are often placed in the impossible position of having to produce dramatic results whilst receiving very little support or funding. The way round this, in the beginning at least, is to adopt the following 'golden rule':

Show results to get resources

The five steps to showing results are:

1 *Gain control*
    The first thing you have to do is gain control of energy consumption.
2 *Measure how well you are doing*
    It is no use just comparing last year's consumption with this year's. You have to adjust for two key variables: the weather and building use.
3 *Report simply, clearly and relevantly*
    People responsible for energy use need simple clear reports that match the information they are used to handling in the rest of their work.
4 *Share the glory*
    To maintain enthusiasm for energy conservation you must ensure that people get praise and credit for making savings.
5 *Promote your achievements with your superiors*
    It is not sufficient to do a good job, you must also publicise your success in order to get further funding.

    This report contains information which should help you improve your energy management policies and practices. Work through it as your circumstances dictate. Achieving improvements may be a lengthy process so use the matrix regularly once a year to help you chart the progress you are making.